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June 30, 2010
(PBW Project No. 1352)

VIA FEDERAL EXPRESS

Mr. Gary Miller
Remedial Project Manager
U.S. Environmental Protection Agency, Region 6
Superfund Division (6SF-RA)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Ms. Barbara Nann
Assistant Regional Counsel
U.S. Environmental Protection Agency, Region 6
Superfund Division (6RC-S)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

**RE: FINAL SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
REPLACEMENT TABLE PAGES
GULFCO MARINE MAINTENANCE SUPERFUND SITE
FREEPORT, TEXAS**

Dear Mr. Miller and Ms. Nann:

Please find enclosed three (3) copies (Mr. Miller) and one copy (Ms. Nann) of replacement pages for Tables 19, 25, 27, 28, F-3, G-3, H-3, I-3, F-9, and H-9 for the Final Screening Level Ecological Risk Assessment (SLERA) for the Gulfco Marine Maintenance Superfund Site. These replacement pages address the modifications requested in EPA's letter dated June 9, 2010 (received on June 14, 2010), which approved the Final SLERA dated May 3, 2010. Although not requested in Comment 6, a replacement page for Table I-9 is also included because it needed the same clarification as requested of Tables F-9 and H-9 in Comment 6. Please insert the enclosed tables in place of their respective versions included with the May 3, 2010 report.

This report was prepared by Pastor, Behling & Wheeler, LLC (PBW) on behalf of LDL Coastal Limited LP (LDL), Chromalloy American Corporation (Chromalloy) and The Dow Chemical Company (Dow). In accordance with Paragraph 52 of the amended Unilateral Administrative Order for the Site, effective January 31, 2008 (the amended UAO), I certify that I have been fully authorized by these Respondents to submit this document and to legally bind these Respondents thereto.



Mr. Gary Miller and Ms. Barbara Nann
June 30, 2010
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Paragraph 13 of the Statement of Work attached to the amended UAO requires an electronic copy of project deliverables be provided in WordPerfect® format. However, as requested by Mr. Miller for previous project deliverables, the electronic copy of the report text is provided in Microsoft Word® format and the other report components are provided in Adobe® format instead. Although the requested modifications only resulted in changes to the specific tables noted above, as such, we are submitting only hard copies of the revised tables, the enclosed DVD contains the report text, tables, and appendices in their entirety.

Thank you for the opportunity to submit this final report. Should you have any questions, please do not hesitate to contact me at any time.

Sincerely,

PASTOR, BEHLING & WHEELER, LLC

Kenby Tugendall for

Eric F. Pastor, P.E.
Principal Engineer

Enclosure

cc: Ms. Luda Voskov – Texas Commission on Environmental Quality (2 copies)
Mr. Doug McReynolds – EA Engineering, Science and Technology
Ms. Jessica White – National Oceanic and Atmospheric Administration
Mr. Ron Brinkley – US Fish and Wildlife Service
Mr. Don Pitts – Texas Parks and Wildlife Department
Mr. Andy Tirpak – Texas Parks and Wildlife Department
Mr. Tommy Mobley – Texas General Land Office
Ms. Vickie Reat – Texas Commission on Environmental Quality
Mr. Larry Champagne - Texas Commission on Environmental Quality

Mr. Gary Miller and Ms. Barbara Nann

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bcc: Mr. Brent Murray – Environmental Quality, Inc.
Mr. Ray Merrell – Sequa Corporation
Mr. Donnie Belote – The Dow Chemical Company
Mr. Allen Daniels - LDL Coastal Limited, LP (w/o enclosure)
Mr. F. William Mahley - Strasburger & Price, LLP
Mr. James C. Morriss III - Thompson & Knight, LLP
Ms. Elizabeth Webb - Thompson & Knight, LLP
Ms. Taryn Scholz – Quality Assurance Associates

TABLE 19
ESTUARINE WETLAND AND AQUATIC HABITAT ASSESSMENT AND MEASUREMENT ENDPOINTS

Receptor Group	Receptor of Potential Concern	Assessment Endpoint for SLERA	Ecological Risk Question	Testable Hypothesis for SLERA	Measurement Endpoint
Benthos and zooplankton	Polychaetes	Protection of benthic invertebrate community from uptake and direct toxic effects on abundance, diversity, and productivity due to chemicals in sediment.	1) Does exposure to chemicals in sediment adversely affect the abundance, diversity, productivity, and function? 2) Do sediment-to-biota BSAs suggest uptake of chemicals?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor specific screening level based on ERLs available in the literature. 2) Evaluate compound's ability to bioconcentrate. 3) Evaluate likelihood of localized effects (maximum concentration).
Fish and shellfish	Fiddler crab	Protection of invertebrate community abundance, diversity, and productivity due to uptake of chemicals in sediment.	1) Does exposure to chemical in sediment adversely affect the survival, reproduction, or growth? 2) Do sediment-to-biota BSAs suggest uptake of chemicals?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor specific screening level based on ERLs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Killifish	Protection of localized herbivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment, surface water, and biota.	1) Does exposure to chemical in sediment or surface water adversely affect the survival, reproduction, or growth? 2) Do bioaccumulation factors (BAFs) suggest uptake of chemicals?	Maximum surface water concentrations do not exceed surface water quality standards; and uptake of compounds in sediment and surface water does not result in tissue concentrations greater than literature-based measurements of toxicity.	1) Comparison of maximum concentration for each compound measured at the Site in surface water to surface water quality standards. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and biota.
Carnivorous fish	Black drum	Protection of carnivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment, surface water and prey items.	1) Does exposure to chemicals in sediment, surface water and/or prey items adversely affect the survival, growth, and reproduction of a first order carnivorous fish? 2) Do bioaccumulation factors (BAFs) suggest uptake of chemicals and/or bioaccumulation?	Maximum surface water concentrations do not exceed surface water quality standards; and uptake of compounds in sediment, surface water, and prey items does not result in tissue concentrations greater than literature-based measurements of toxicity.	1) Comparison of maximum concentration for each compound measured at the Site in surface water to surface water quality standards. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and prey items.
	Spotted seatrout	Protection of carnivorous fish survival, growth, and reproduction due to uptake of chemicals in surface water and prey items.	1) Does exposure to chemicals in surface water or prey items adversely affect the survival, growth, and reproduction of a second order carnivorous fish? 2) Do bioaccumulation factors (BAFs) suggest bioaccumulation?	Maximum surface water concentrations do not exceed surface water quality standards; and uptake of compounds in sediment, surface water, and prey items does not result in tissue concentrations greater than literature-based measurements of toxicity.	1) Comparison of maximum concentration for each compound measured at the Site in surface water to surface water quality standards. 2) Evaluate compound's ability to bioconcentrate in prey items.
Avian carnivore	Sandpiper	Protection of carnivorous avian survival, growth, and reproduction due to uptake of chemicals in sediment and prey items and via surface water ingestion.	1) Does exposure to chemicals in sediment, surface water and/or prey items adversely affect the survival, growth, and reproduction of a first order carnivore? 2) Do bioaccumulation factors (BAFs) suggest uptake or bioaccumulation?	95% UCL intake levels do not exceed literature-based measurements of toxicity.	1) Comparison of 95% UCL concentrations in sediment and mobile prey items (fish), and maximum concentrations in sedentary prey items (worms and crab) surface water for each compound measured at the Site to receptor-specific NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and prey items.
	Green heron	Protection of carnivorous avian survival, growth and reproduction due to uptake of chemicals in prey items and via surface water ingestion.	1) Does exposure to chemicals in surface water and prey items adversely affect the survival, growth, and reproduction of a second order carnivore? 2) Do bioaccumulation factors (BAFs) suggest bioaccumulation?	95% UCL intake levels do not exceed literature-based measurements of toxicity.	1) Comparison of 95% UCL concentrations in sediment and mobile prey items (fish), and maximum concentrations in sedentary prey items (worms and crab) surface water for each compound measured at the Site to receptor-specific NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and prey items.

Notes:

SLERA – Screening-Level Ecological Risk Assessment

BAF – biota accumulation factor

BSAF – biota to sediment accumulation factor

NOAEL – no observable adverse effects level

95% UCL -- 95 percent upper confidence limit on the mean

ERL – Effects Range Low

TABLE 25
ECOLOGICAL HAZARD QUOTIENTS EXCEEDING ONE FOR SEDIMENT AND SURFACE WATER*

MEDIA	RECEPTOR	MEDIA OF POTENTIAL ECOLOGICAL CONCERN	CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	TOXICITY VALUE*	EXPOSURE POINT CONCENTRATION (mg/kg)	BASIS FOR EPC	EHQ
Intracoastal Waterway	Polychaetes (<i>Capitella capitata</i>)	Sediment	4,4'-DDT	ERL	3.32E-03	Maximum	2.8
		Sediment	Acenaphthene	ERL	6.31E-02	Maximum	4
		Sediment	Benz(a)anthracene	ERL	3.95E-01	Maximum	1.5
		Sediment	Chrysene	ERL	4.75E-01	Maximum	1.2
		Sediment	Dibenzo(a,h)anthracene	ERL	2.35E-01	Maximum	3.7
		Sediment	Fluoranthene	ERL	8.04E-01	Maximum	1.3
		Sediment	Fluorene	ERL	4.80E-02	Maximum	2.4
		Sediment	Hexachlorobenzene	AET	3.19E-02	Maximum	5.3
		Sediment	Phenanthrene	ERL	5.08E-01	Maximum	2.1
		Sediment	Pyrene	ERL	8.82E-01	Maximum	1.3
		Sediment	LPAH	ERL	7.10E-01	Maximum	1.3
		Sediment	HPAH	ERL	4.91E+00	Maximum	2.9
		Sediment	Total PAH	ERL	5.62E+00	Maximum	1.4
		Sediment	Dibenzo(a,h)anthracene	midpoint ERL/ERM	2.35E-01	Maximum	1.5
Background Intracoastal Waterway	Avian Carnivore (Sandpiper) Avian Carnivore (Green Heron)	Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment	Arsenic	ERL	9.82E+00	Maximum	1.2
		Sediment	Nickel	ERL	2.73E+01	Maximum	1.3
		Sediment	none	midpoint ERL/ERM			<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Aquatic Invertebrates and Fish	Surface Water	4,4'-DDT Silver	Water Quality Standard Water Quality Standard	1.3E-05 mg/L 6E-03 mg/L	Maximum Maximum
		Sediment	2-Methylnaphthalene	ERL	4.30E-01	Maximum	6.1
		Sediment	4,4'-DDT	ERL	9.22E-03	Maximum	7.8
Wetlands	Polychaetes (<i>Capitella capitata</i>)	Sediment	Acenaphthene	ERL	1.33E-01	Maximum	8.3
		Sediment	Acenaphthylene	ERL	5.45E-01	Maximum	12.4
		Sediment	Anthracene	ERL	3.34E-01	Maximum	3.9
		Sediment	Arsenic	ERL	1.28E+01	Maximum	1.6
		Sediment	Benz(a)anthracene	ERL	9.93E-01	Maximum	3.8
		Sediment	Benz(a)pyrene	ERL	1.30E+00	Maximum	3
		Sediment	Benz(g,h,i)perylene	AET	1.94E+00	Maximum	2.9
		Sediment	Chrysene	ERL	4.05E+00	Maximum	10.5
		Sediment	Copper	ERL	4.90E+01	Maximum	1.4
		Sediment	Dibenzo(a,h)anthracene	ERL	2.91E+00	Maximum	45.9
Wetlands	Polychaetes (<i>Capitella capitata</i>)	Sediment	Endrin Aldehyde	ERL	1.00E-02	Maximum	3.8
		Sediment	Endrin Ketone	ERL	1.30E-02	Maximum	4.9
		Sediment	Fluoranthene	ERL	2.17E+00	Maximum	3.6
		Sediment	Fluorene	ERL	1.39E-01	Maximum	7.3
		Sediment	gamma-Chlordane	ERL	3.60E-03	Maximum	1.8
		Sediment	Indeno(1,2,3-cd)pyrene	AET	1.94E+00	Maximum	3.2
		Sediment	Lan	ERL	2.37E+02	Maximum	5.1
		Sediment	Nickel	ERL	2.77E+01	Maximum	1.3
		Sediment	Phenanthrene	ERL	1.30E+00	Maximum	5.4
		Sediment	Pyrene	ERL	1.64E+00	Maximum	2.5
Pond	Polychaetes (<i>Capitella capitata</i>)	Sediment	Zinc	ERL	9.03E+02	Maximum	6
		Sediment	LPAH	ERL	2.90E+00	Maximum	5.2
		Sediment	HPAH	ERL	1.90E+01	Maximum	11.2
		Sediment	TOTAL PAHs	ERL	2.19E+01	Maximum	5.5
		Sediment	2-Methylnaphthalene	midpoint ERL/ERM	4.30E-01	Maximum	1.2
		Sediment	Acenaphthylene	midpoint ERL/ERM	5.45E-01	Maximum	1.8
		Sediment	Benz(a)anthracene	midpoint ERL/ERM	9.93E-01	Maximum	1.1
		Sediment	Benz(a)pyrene	midpoint ERL/ERM	1.30E+00	Maximum	1.3
		Sediment	Chrysene	midpoint ERL/ERM	4.04E+00	Maximum	2.5
		Sediment	Dibenzo(a,h)anthracene	midpoint ERL/ERM	2.91E+00	Maximum	18
Pond	Polychaetes (<i>Capitella capitata</i>)	Sediment	Lead	midpoint ERL/ERM	2.37E+02	Maximum	1.8
		Sediment	Phenanthrene	midpoint ERL/ERM	1.30E+00	Maximum	1.5
		Sediment	Zinc	midpoint ERL/ERM	9.03E+02	Maximum	3.2
		Sediment	LPAH	midpoint ERL/ERM	2.90E+00	Maximum	1.6
		Sediment	HPAH	midpoint ERL/ERM	1.90E+01	Maximum	3.4
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Aquatic Invertebrates and Fish	Surface Water	Acrolein	Water Quality Standard	9.29E-03 mg/L	Maximum
		Aquatic Invertebrates and Fish	Surface Water	Copper	Water Quality Standard	1.1E-02 mg/L	>WQS
		Sediment	4,4'-DDT	ERL	1.57E-03	Maximum	1.3
Avian Carnivore (Sandpiper) Avian Carnivore (Green Heron)	Avian Carnivore (Sandpiper) Avian Carnivore (Green Heron)	Sediment	Zinc	ERL	9.95E+02	Maximum	8.7
		Sediment	Zinc	midpoint ERL/ERM	9.99E+02	Maximum	3.6
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
Aquatic Invertebrates and Fish	Aquatic Invertebrates and Fish	Surface Water	Silver	Water Quality Standard	2.9E-03 mg/L	Maximum	>WQS

Notes:

ERL - effects range low

ERM - effects range medium

AET - apparent effects threshold

EHQ - ecological hazard quotient

NOAEL - no observable adverse effects level

PAH - polynuclear aromatic hydrocarbon

LPAH - low-molecular weight PAH

HPAH - high-molecular weight PAH

95% UCL - 95th percentile upper confidence limit on the mean

*See Tables F-2, G-2, H-2, and I-2 in Appendices for further information about the toxicity reference values used in the risk calculations.

+ Compounds shown in Table 21 but not listed in this Table, had HQs less than one.

TABLE 27
COPECS* IN SEDIMENT LACKING TOXICITY REFERENCE VALUES

Parameter	Benthic Invertebrates	Avian Carnivore (Sandpiper)	Avian Carnivore (Green Heron)
1,2-Dichlorethane	NV	NV	NV
1,2-Diphenylhydrazine/azobenzene	NV	NV	NV
1,2,4-Trimethylbenzene	NV	NV	NV
1,4-Dichlorobenzene	V	NV	NV
2-Butanone	NV	NV	NV
2-Methylnaphthalene	V	NV	NV
2,4,6-Trichlorophenol	NV	NV	NV
3,3'-Dichlorobenzidine	NV	NV	NV
4,4'-DDD	V	V	V
4,4'-DDT	V	V	V
4,6-Dinitro-2-methylphenol	NV	NV	NV
Acenaphthene	V	NV	NV
Acenaphthylenne	V	NV	NV
Acetone	NV	V	V
Aluminum	NV	V	V
Anthracene	V	NV	NV
Antimony	V	NV	NV
Arsenic	V	NV	NV
Atrazine (Aatrex)	NV	NV	NV
Barium	V	NV	NV
Benzo(a)anthracene	V	NV	NV
Benzo(a)pyrene	V	NV	NV
Benzo(b)fluoranthene	V	NV	NV
Benzo(g,h,i)perylene	V	NV	NV
Benzo(k)fluoranthene	V	NV	NV
Beryllium	NV	NV	NV
beta-BHC	NV	NV	NV
Boron	V	NV	NV
Bromomethane	NV	NV	NV
Butyl Benzyl Phthalate	NV	NV	NV
Cadmium	V	V	V
Carbazole	NV	NV	NV
Carbon Disulfide	NV	NV	NV
Chloroform	NV	NV	NV
Chromium	NV	V	V
Chromium VI	NV	V	V
Chrysene	V	NV	NV
cis-1,2-Dichloroethene	NV	NV	NV
Cobalt	NV	NV	NV
Copper	V	V	V
Cyclohexane	NV	NV	NV
Oibenzo(a,h)anthracene	V	NV	NV
Oibenzo furan	V	NV	NV
Diethyl Phthalate	NV	V	V
Di-n-octyl Phthalate	NV	V	V
Endosulfan Sulfate	NV	NV	NV
Endrin Aldehyde	V	V	V
Endrin Ketone	V	V	V
Fluoranthene	V	NV	NV
Fluorene	V	NV	NV
gamma-Chlordane	V	V	V
Hexachlorobenzene	V	V	V
Indeno(1,2,3-cd)pyrene	V	NV	NV
Iron	NV	NV	NV
Isopropylbenzene (cumene)	NV	NV	NV
Lead	V	V	V
Lithium	NV	NV	NV
m,p-Cresol	NV	NV	NV
Manganese	V	NV	NV
Mercury	V	V	V
Methylcyclohexane	NV	NV	NV
Methyl Iodide	NV	NV	NV
Molybdenum	NV	V	V
Nickel	V	V	V
n-Nitrosodiphenylamine	NV	NV	NV
Phenanthrene	V	NV	NV
Pyrene	V	NV	NV
Silver	V	V	V
Strontium	NV	NV	NV
Tin	NV	NV	NV
Titanium	NV	NV	NV
Toluene	NV	NV	NV
Trichloroethene	V	NV	NV
Vanadium	V	V	V
Xylene	V	NV	NV
Zinc	V	V	V
LPAH	V	NV	NV
HPAH	V	NV	NV
Total PAHs	V	NV	NV

Notes:

- * COPECS - Compound of potential ecological concern.
- ** - Includes fiddler crabs and polychaetes such as *Capitella capitata*.
- NV - No toxicity reference value available.
- V - Value available and provided in Appendices F, G, H and I.

TABLE 28
COPECS* IN SURFACE WATER LACKING SURFACE WATER QUALITY CRITERIA**

Parameter	Water Quality Criteria
1,2-Dichloroethane (total)	V
4-Chloroaniline (total)	NV
4,4'-DDD (total)	V
4,4'-DDT (total)	V
Acetone (total)	V
Acrolein (total)	V
Acrylonitrile (total)	V
Aldrin (total)	V
Aluminum (total and dissolved)	NV
Antimony (total and dissolved)	NV
Arsenic (total)	NV
Barium (total and dissolved)	V
Benzo(a)pyrene (total)	NV
Benzo(b)fluoranthene (total)	NV
Benzo(g,h,i)perylene (total)	NV
Benzo(k)fluoranthene (total)	NV
Bis(ethylhexyl) Phthalate (total)	NV
Boron (total and dissolved)	NV
Chromium (total and dissolved)	V for dissolved
Chromium VI (total)	NV
Chrysene (total)	NV
Cobalt (total)	NV
Copper (total and dissolved)	V for dissolved
Dibenz(a,h)anthracene (total)	NV
Di-n-butyl Phthalate (total)	V
Di-n-octyl Phthalate (total)	NV
Indeno(1,2,3-cd)pyrene (total)	NV
Iron (total and dissolved)	NV
Lead (total)	NV
Lithium (total and dissolved)	NV
Manganese (total and dissolved)	NV
Mercury (total)	V
Methoxychlor (total)	NV
Molybdenum (total and dissolved)	NV
Nickel (total and dissolved)	V for dissolved
Selenium (total and dissolved)	V
Silver (total and dissolved)	V for dissolved
Strontium (total and dissolved)	NV
Thallium (total and dissolved)	V
Titanium (total)	NV
Vanadium (total and dissolved)	NV
Zinc (total)	NV
HPAhs (total)	NV
Total PAHs (total)	NV

Notes:

* COPECS - Compound of potential ecological concern.

** - Surface water quality criteria are protective of fish and aquatic invertebrates.

NV - No toxicity reference value available.

V - Value available.

TABLE F-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
Polychaetes and Other Benthic Invertebrates

Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table F-2	
	Exposure Point Concentration (SC)	ERL	
		Maximum EHQ*	
Chemical			
1,2-Dichloroethane	3.02E-03	0.00E+00	no ERL
1,2-Diphenylhydrazine/azobenzene	3.17E-02	0.00E+00	no ERL
2-Methylnaphthalene	1.88E-02	7.00E-02	2.69E-01
3,3'-Dichlorobenzidine	1.51E-01	0.00E+00	no ERL
4,4'-DDT	3.32E-03	1.19E-03	2.79E+00
4,6-Dinitro-2-methylphenol	6.27E-02	0.00E+00	no ERL
Acenaphthene	6.31E-02	1.60E-02	3.94E+00
Aluminum	1.25E+04	0.00E+00	no ERL
Anthracene	7.53E-02	8.53E-02	8.83E-01
Antimony	8.14E+00	9.30E+00	8.75E-01
Arsenic	7.62E+00	8.20E+00	9.29E-01
Atrazine (Aatrex)	8.14E-02	0.00E+00	no ERL
Barium	3.77E+02	0.00E+00	no ERL
Benz(a)anthracene	3.95E-01	2.61E-01	1.51E+00
Benz(a)pyrene	4.45E-01	4.30E-01	1.03E+00
Benz(b)fluoranthene	6.11E-01	1.80E+00	3.39E-01
Benz(g,h,i)perylene	4.42E-01	6.70E-01	6.60E-01
Benz(k)fluoranthene	3.18E-01	1.80E+00	1.77E-01
Beryllium	8.20E-01	0.00E+00	no ERL
Boron	2.72E+01	0.00E+00	no ERL
Butyl Benzyl Phthalate	2.02E-01	0.00E+00	no ERL
Carbazole	8.61E-02	0.00E+00	no ERL
Chloroform	5.27E-03	0.00E+00	no ERL
Chromium	1.44E+01	0.00E+00	no ERL
Chrysene	4.75E-01	3.84E-01	1.24E+00
Cobalt	7.16E+00	0.00E+00	no ERL
Copper	1.26E+01	3.40E+01	3.71E-01
Cyclohexane	1.92E-03	0.00E+00	no ERL
Dibenz(a,h)anthracene	2.35E-01	6.34E-02	3.71E+00
Dibenzofuran	3.05E-02	1.10E-01	2.77E-01
Diethyl Phthalate	3.89E-02	0.00E+00	no ERL
Di-n-octyl Phthalate	1.92E-01	0.00E+00	no ERL
Fluoranthene	8.04E-01	6.00E-01	1.34E+00
Fluorene	4.60E-02	1.90E-02	2.42E+00
gamma-Chlordane	8.26E-04	2.26E-03	3.65E-01
Hexachlorobenzene	3.19E-02	6.00E-03	5.32E+00
Indeno(1,2,3-cd)pyrene	4.05E-01	6.00E-01	6.75E-01
Iron	2.82E+04	0.00E+00	no ERL
Isopropylbenzene (cumene)	7.04E-03	0.00E+00	no ERL
Lead	3.23E+01	4.67E+01	6.92E-01
Lithium	2.00E+01	0.00E+00	no ERL
Manganese	4.74E+02	0.00E+00	no ERL
Mercury	3.60E-02	1.50E-01	2.40E-01
Methylcyclohexane	3.70E-03	0.00E+00	no ERL
Molybdenum	5.66E+00	0.00E+00	no ERL
Nickel	1.67E+01	2.09E+01	7.99E-01
n-Nitrosodiphenylamine	4.34E-02	0.00E+00	no ERL
Phenanthrene	5.08E-01	2.40E-01	2.12E+00
Pyrene	8.62E-01	6.65E-01	1.30E+00
Silver	5.40E-01	1.00E+00	5.40E-01
Strontium	8.17E+01	0.00E+00	no ERL
Titanium	3.66E+01	0.00E+00	no ERL
Toluene	5.81E-03	0.00E+00	no ERL
Vanadium	2.12E+01	5.70E+01	3.72E-01
Zinc	9.26E+01	1.50E+02	6.17E-01
LPAH	7.11E-01	5.52E-01	1.29E+00
HPAH	4.99E+00	1.70E+00	2.94E+00
Total PAHs	5.70E+00	4.02E+00	1.42E+00

Notes:

- * EPC for benthic receptors is maximum measured concentration from Report Table 6.
- * Shading indicates EHQ > 1.

TABLE F-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
Polychaetes and Other Benthic Invertebrates -- COMPARED WITH MIDPOINT BETWEEN ERL and ERM

Ecological Hazard Quotient = Sc / (midpoint ERL/ERM)			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL/ERM	Midpoint between Effects Range-Low and Effects Range-Medium (mg/kg)	see Table F-2	
Chemical	Exposure Point Concentration* (Sc)	ERL/ERM	Maximum EHQ
1,2-Dichloroethane	3.02E-03	0.00E+00	no ERL/ERM
1,2-Diphenylhydrazine/azobenzene	3.17E-02	0.00E+00	no ERL/ERM
2-Methylnaphthalene	1.88E-02	3.70E-01	5.08E-02
3,3'-Dichlorobenzidine	1.51E-01	0.00E+00	no ERL/ERM
4,4'-DDT	3.32E-03	3.20E-02	1.04E-01
4,6-Dinitro-2-methylphenol	6.27E-02	0.00E+00	no ERL/ERM
Acenaphthene	6.31E-02	2.58E-01	2.45E-01
Aluminum	1.25E+04	0.00E+00	no ERL/ERM
Anthracene	7.53E-02	5.93E-01	1.27E-01
Antimony	8.14E+00	9.30E+00	8.75E-01
Arsenic	7.62E+00	3.91E+01	1.95E-01
Atrazine (Aatrex)	8.14E-02	0.00E+00	no ERL/ERM
Barium	3.77E+02	0.00E+00	no ERL/ERM
Benz(a)anthracene	3.95E-01	9.31E-01	4.25E-01
Benz(a)pyrene	4.45E-01	1.02E+00	4.38E-01
Benz(b)fluoranthene	6.11E-01	1.80E+00	3.39E-01
Benz(g,h,i)perylene	4.42E-01	6.70E-01	6.60E-01
Benz(k)fluoranthene	3.18E-01	1.80E+00	1.77E-01
Beryllium	8.20E-01	0.00E+00	no ERL/ERM
Boron	2.72E+01	0.00E+00	no ERL/ERM
Butyl Benzyl Phthalate	2.02E-01	0.00E+00	no ERL/ERM
Carbazole	8.61E-02	0.00E+00	no ERL/ERM
Chloroform	5.27E-03	0.00E+00	no ERL/ERM
Chromium	1.44E+01	0.00E+00	no ERL/ERM
Chrysene	4.75E-01	1.59E+00	2.98E-01
Cobalt	7.16E+00	0.00E+00	no ERL/ERM
Copper	1.26E+01	1.52E+02	8.29E-02
Cyclohexane	1.92E-03	0.00E+00	no ERL/ERM
Dibenz(a,h)anthracene	2.35E-01	1.62E-01	1.45E+00
Dibenzofuran	3.05E-02	1.10E-01	2.77E-01
Diethyl Phthalate	3.89E-02	0.00E+00	no ERL/ERM
Di-n-octyl Phthalate	1.92E-01	0.00E+00	no ERL/ERM
Fluoranthene	8.04E-01	2.85E+00	2.82E-01
Fluorene	4.60E-02	2.80E-01	1.65E-01
gamma-Chlordane	8.26E-04	3.53E-03	2.34E-01
Hexachlorobenzene	3.19E-02	6.00E-03	5.32E+00
Indeno(1,2,3-cd)pyrene	4.05E-01	6.00E-01	6.75E-01
Iron	2.82E+04	0.00E+00	no ERL/ERM
Isopropylbenzene (cumene)	7.04E-03	0.00E+00	no ERL/ERM
Lead	3.23E+01	1.32E+02	2.44E-01
Lithium	2.00E+01	0.00E+00	no ERL/ERM
Manganese	4.74E+02	0.00E+00	no ERL/ERM
Mercury	3.60E-02	4.30E-01	8.37E-02
Methylcyclohexane	3.70E-03	0.00E+00	no ERL/ERM
Molybdenum	5.66E+00	0.00E+00	no ERL/ERM
Nickel	1.67E+01	3.63E+01	4.61E-01
n-Nitrosodiphenylamine	4.34E-02	0.00E+00	no ERL/ERM
Phenanthrene	5.08E-01	8.70E-01	5.84E-01
Pyrene	8.62E-01	1.63E+00	5.28E-01
Silver	5.40E-01	2.35E+00	2.30E-01
Strontium	8.17E+01	0.00E+00	no ERL/ERM
Titanium	3.66E+01	0.00E+00	no ERL/ERM
Toluene	5.81E-03	0.00E+00	no ERL/ERM
Vanadium	2.12E+01	5.70E+01	3.72E-01
Zinc	9.26E+01	2.80E+02	3.31E-01
LPAH	7.11E-01	1.86E+00	3.83E-01
HPAH	4.99E+00	5.65E+00	8.84E-01
Total PAHs	5.70E+00	2.44E+01	2.34E-01

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 6.

* Shading indicates EHQ > 1.

TABLE G-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
BACKGROUND
Polychaetes and Other Benthic Invertebrates

Ecological Hazard Quotient = Sc/ERL			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table G-2	
Chemical	Exposure Point Concentration: (Sc)	ERL	Maximum EHQ
1,2,4-Trimethylbenzene	3.91E-03	0.00E+00	no ERL
1,4-Dichlorobenzene	4.11E-03	1.10E-01	3.74E-02
2-Butanone	2.16E-03	0.00E+00	no ERL
4,4'-DDT	5.70E-04	1.19E-03	4.79E-01
Aluminum	2.18E+04	0.00E+00	no ERL
Antimony	7.33E+00	9.30E+00	7.88E-01
Arsenic	9.62E+00	8.20E+00	1.17E+00
Barium	2.80E+02	0.00E+00	no ERL
Benzo(b)fluoranthene	3.69E-02	1.80E+00	2.05E-02
Beryllium	1.32E+00	0.00E+00	no ERL
Boron	4.79E+01	0.00E+00	no ERL
Carbon Disulfide	8.41E-03	0.00E+00	no ERL
Chromium	2.25E+01	0.00E+00	no ERL
cis-1,2-Dichloroethene	2.84E-02	0.00E+00	no ERL
Cobalt	1.18E+01	0.00E+00	no ERL
Copper	1.68E+01	3.40E+01	4.94E-01
Iron	2.79E+04	0.00E+00	no ERL
Lead	1.45E+01	4.67E+01	3.10E-01
Lithium	4.46E+01	0.00E+00	no ERL
Manganese	4.42E+02	0.00E+00	no ERL
Mercury	5.00E-02	1.50E-01	3.33E-01
Molybdenum	3.50E-01	0.00E+00	no ERL
Nickel	2.73E+01	2.09E+01	1.31E+00
Strontium	8.74E+01	0.00E+00	no ERL
Titanium	5.45E+01	0.00E+00	no ERL
Trichloroethene	1.59E-02	4.10E-02	3.88E-01
Vanadium	3.42E+01	5.70E+01	6.00E-01
Xylene	3.35E-03	4.00E-03	8.38E-01
Zinc	5.41E+01	1.50E+02	3.61E-01
LPAHs			no ERL
HPAH	3.69E-02	1.70E+00	2.17E-02
Total PAHs	3.69E-02	4.02E+00	9.17E-03

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 7.

* Shading indicates EHQ > 1.

TABLE H-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
POLYCHAETES AND OTHER BENTHIC INVERTEBRATES

Ecological Hazard Quotient = Sc / ERL			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table H-2	
Chemical	Exposure Point Concentration (Sc)	ERL	Maximum EHQ*
1,2-Dichloroethane	2.40E-03	0.00E+00	no ERL
2-Methylnaphthalene	4.30E-01	7.00E-02	6.14E+00
4,4'-DDT	9.22E-03	1.19E-03	7.75E+00
Acenaphthene	1.33E-01	1.60E-02	8.31E+00
Acenaphthylene	5.45E-01	4.40E-02	1.24E+01
Aluminum	1.82E+04	0.00E+00	no ERL
Anthracene	3.34E-01	8.53E-02	3.92E+00
Antimony	4.24E+00	8.20E+00	5.17E-01
Arsenic	1.28E-01	8.20E+00	1.56E+00
Barium	8.20E+02	0.00E+00	no ERL
Benzo(a)anthracene	9.93E-01	2.61E-01	3.80E+00
Benzo(a)pyrene	1.30E+00	4.30E-01	3.02E+00
Benzo(b)fluoranthene	1.36E+00	1.80E+00	7.56E-01
Benzo(g,h,i)perylene	1.94E+00	6.70E-01	2.90E+00
Benzo(k)fluoranthene	7.30E-01	1.80E+00	4.06E-01
Beryllium	1.37E+00	0.00E+00	no ERL
Boron	4.62E+01	0.00E+00	no ERL
Cadmium	4.80E-01	1.20E+00	4.00E-01
Carbazole	1.41E-01	0.00E+00	no ERL
Carbon Disulfide	6.99E-03	0.00E+00	no ERL
Chromium	4.46E+01	0.00E+00	no ERL
Chromium VI	4.04E+00	0.00E+00	no ERL
Chrysene	4.05E+00	3.84E-01	1.05E+01
Cobalt	9.89E+00	0.00E+00	no ERL
Copper	4.90E+01	3.40E+01	1.44E+00
Dibenz(a,h)anthracene	2.91E+00	6.34E-02	4.59E+01
Dibenzofuran	8.00E-02	1.10E-01	7.27E-01
Endosulfan Sulfate	6.00E-02	0.00E+00	no ERL
Endrin Aldehyde	1.00E-02	2.67E-03	3.75E+00
Endrin Ketone	1.30E-02	2.67E-03	4.87E+00
Fluoranthene	2.17E+00	6.00E-01	3.62E+00
Fluorene	1.39E-01	1.90E-02	7.32E+00
gamma-Chlordane	3.60E-03	2.26E-03	1.59E+00
Indeno(1,2,3-cd)pyrene	1.94E+00	6.00E-01	3.23E+00
Iron	6.09E+04	0.00E+00	no ERL
Lead	2.37E+02	4.67E+01	5.07E+00
Lithium	2.76E+01	0.00E+00	no ERL
Manganese	1.01E+03	0.00E+00	no ERL
Mercury	8.10E-02	1.50E-01	5.40E-01
Molybdenum	3.24E+00	0.00E+00	no ERL
Nickel	2.77E+01	2.09E+01	1.33E+00
Phenanthrene	1.30E+00	2.40E-01	5.42E+00
Pyrene	1.64E+00	6.65E-01	2.47E+00
Strontium	3.30E+02	0.00E+00	no ERL
Tin	4.61E+00	0.00E+00	no ERL
Titanium	6.87E+01	0.00E+00	no ERL
Toluene	2.14E-03	0.00E+00	no ERL
Vanadium	3.20E+01	5.70E+01	5.61E-01
Zinc	9.03E+02	1.50E+02	6.02E+00
LPAH	2.88E+00	5.52E-01	5.22E+00
HPAH	1.90E+01	1.70E+00	1.12E+01
TOTAL PAHs	2.19E+01	4.02E+00	5.45E+00

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 8.

* Shading indicates EHQ > 1.

TABLE H-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
POLYCHAETES AND OTHER BENTHIC INVERTEBRATES -- MIDPOINT BETWEEN ERL AND ERM COMPARISON

Ecological Hazard Quotient = Sc / (midpoint ERL/ERM)			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL/ERM	Midpoint between Effects Range-Low and Effects Range-Medium (mg/kg)	see Table H-2	
Chemical	Exposure Point Concentration* (Sc)	TRV	Maximum EHQ*
1,2-Dichloroethane	2.40E-03	0.00E+00	no ERL/ERM
2-Methylnaphthalene	4.30E-01	3.70E-01	1.16E+00
4,4'-DDT	9.22E-03	3.20E-02	2.88E-01
Acenaphthene	1.33E-01	2.58E-01	5.16E-01
Acenaphthylene	5.45E-01	3.42E-01	1.59E+00
Aluminum	1.82E+04	0.00E+00	no ERL/ERM
Anthracene	3.34E-01	5.93E-01	5.64E-01
Antimony	4.24E+00	3.91E+01	1.08E-01
Arsenic	1.28E+01	3.91E+01	3.27E-01
Barium	8.20E+02	0.00E+00	no ERL/ERM
Benz(a)anthracene	9.93E-01	9.31E-01	1.07E+00
Benz(a)pyrene	1.30E+00	1.02E+00	1.28E+00
Benz(b)fluoranthene	1.36E+00	1.80E+00	7.56E-01
Benz(g,h,i)perylene	1.94E+00	6.70E-01	2.90E+00
Benz(k)fluoranthene	7.30E-01	1.80E+00	4.06E-01
Beryllium	1.37E+00	0.00E+00	no ERL/ERM
Boron	4.62E+01	0.00E+00	no ERL/ERM
Cadmium	4.80E-01	5.40E+00	8.89E-02
Carbazole	1.41E-01	0.00E+00	no ERL/ERM
Carbon Disulfide	6.99E-03	0.00E+00	no ERL/ERM
Chromium	4.46E+01	0.00E+00	no ERL/ERM
Chromium VI	4.04E+00	0.00E+00	no ERL/ERM
Chrysene	4.05E+00	1.59E+00	2.54E+00
Cobalt	9.89E+00	0.00E+00	no ERL/ERM
Copper	4.90E+01	1.52E+02	3.22E-01
Dibenz(a,h)anthracene	2.91E+00	1.62E-01	1.80E+01
Dibenzofuran	8.00E-02	1.10E-01	7.27E-01
Endosulfan Sulfate	6.00E-02	0.00E+00	no ERL/ERM
Endrin Aldehyde	1.00E-02	3.25E-02	3.07E-01
Endrin Ketone	1.30E-02	3.25E-02	4.00E-01
Fluoranthene	2.17E+00	2.85E+00	7.61E-01
Fluorene	1.39E-01	2.80E-01	4.97E-01
gamma-Chlordane	3.60E-03	3.53E-03	1.02E+00
Indeno(1,2,3-cd)pyrene	1.94E+00	6.00E-01	3.23E+00
Iron	6.09E+04	0.00E+00	no ERL/ERM
Lead	2.37E+02	1.32E+02	1.79E+00
Lithium	2.76E+01	0.00E+00	no ERL/ERM
Manganese	1.01E+03	0.00E+00	no ERL/ERM
Mercury	8.10E-02	4.30E-01	1.88E-01
Molybdenum	3.24E+00	0.00E+00	no ERL/ERM
Nickel	2.77E+01	3.63E+01	7.64E-01
Phenanthrene	1.30E+00	8.70E-01	1.49E+00
Pyrene	1.64E+00	1.63E+00	1.00E+00
Strontium	3.30E+02	0.00E+00	no ERL/ERM
Tin	4.61E+00	0.00E+00	no ERL/ERM
Titanium	6.87E+01	0.00E+00	no ERL/ERM
Toluene	2.14E-03	0.00E+00	no ERL/ERM
Vanadium	3.20E+01	5.70E+01	5.61E-01
Zinc	9.03E+02	2.80E+02	3.23E+00
LPAH	2.88E+00	1.86E+00	1.55E+00
HPAH	1.90E+01	5.65E+00	3.37E+00
TOTAL PAHs	2.19E+01	2.44E+01	8.98E-01

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 8.

* Shading indicates EHQ > 1.

TABLE I-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
POLYCHAETES AND OTHER BENTHIC INVERTEBRATES

Ecological Hazard Quotient = Sc / ERL			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table I-2	
Chemical	Exposure Point Concentration* (Sc)	ERL	Maximum EHQ†
2,4,6-Trichlorophenol	4.29E-02	0.00E+00	no ERL
4,4'-DDD	6.76E-04	1.19E-03	5.68E-01
4,4'-DDT	1.57E-03	1.19E-03	1.32E+00
Acetone	7.98E-02	0.00E+00	no ERL
Aluminum	1.63E+04	0.00E+00	no ERL
Antimony	1.85E+00	9.30E+00	1.99E-01
Arsenic	5.01E+00	8.20E+00	6.11E-01
Barium	4.17E+02	0.00E+00	no ERL
Benzo(b)fluoranthene	1.06E-01	1.80E+00	5.89E-02
Benzo(g,h,i)perylene	1.35E-01	6.70E-01	2.01E-01
Benzo(k)fluoranthene	1.30E-01	1.80E+00	7.22E-02
Beryllium	1.13E+00	0.00E+00	no ERL
beta-BHC	6.99E-04	0.00E+00	no ERL
Boron	2.84E+01	0.00E+00	no ERL
Bromomethane	3.10E-02	0.00E+00	no ERL
Cadmium	2.70E-01	1.20E+00	2.25E-01
Carbon Disulfide	7.71E-03	0.00E+00	no ERL
Chromium	2.01E+01	0.00E+00	no ERL
Chrysene	2.57E-02	3.84E-01	6.69E-02
Cobalt	8.99E+00	0.00E+00	no ERL
Copper	2.68E+01	3.40E+01	7.88E-01
Iron	2.01E+04	0.00E+00	no ERL
Lead	3.05E+01	4.67E+01	6.53E-01
Lithium	2.37E+01	0.00E+00	no ERL
m,p-Cresol	3.75E-02	0.00E+00	no ERL
Manganese	7.11E+02	0.00E+00	no ERL
Methyl Iodide	4.10E-02	0.00E+00	no ERL
Molybdenum	6.00E-01	0.00E+00	no ERL
Nickel	2.06E+01	2.09E+01	9.86E-01
Pyrene	2.65E-02	6.65E-01	3.98E-02
Strontium	1.81E+02	0.00E+00	no ERL
Titanium	4.05E+01	0.00E+00	no ERL
Vanadium	2.74E+01	5.70E+01	4.81E-01
Zinc	9.99E+02	1.50E+02	6.66E+00
LPAHs ++			
HPAH	4.23E-01	1.70E+00	2.49E-01
TOTAL PAHs	3.50E-01	4.02E+00	8.70E-02

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 9.

+ Shading indicates EHQ > 1.

++ No LPAHs were detected in the samples.

TABLE I-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
Polychaetes and Other Benthic Invertebrates -- COMPARED WITH MIDPOINT BETWEEN ERL and ERM

Ecological Hazard Quotient = Sc / (midpoint ERL/ERM)			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL/ERM	Midpoint between Effects Range-Low and Effects Range-Medium (mg/kg)	see TRV summary page	
Chemical	Exposure Point Concentration ^a (Sc)	ERL/ERM	Maximum EHQ ^b
2,4,6-Trichlorophenol	4.29E-02	0.00E+00	no ERL/ERM
4,4'-DDD	6.76E-04	3.20E-02	2.11E-02
4,4'-DDT	1.57E-03	3.20E-02	4.90E-02
Acetone	7.98E-02	0.00E+00	no ERL/ERM
Aluminum	1.63E+04	0.00E+00	no ERL/ERM
Antimony	1.85E+00	9.30E+00	1.99E-01
Arsenic	5.01E+00	3.91E+01	1.28E-01
Barium	4.17E+02	0.00E+00	no ERL/ERM
Benzo(b)fluoranthene	1.06E-01	1.80E+00	5.89E-02
Benzo(g,h,i)perylene	1.35E-01	6.70E-01	2.01E-01
Benzo(k)fluoranthene	1.30E-01	1.80E+00	7.22E-02
Beryllium	1.13E+00	0.00E+00	no ERL/ERM
beta-BHC	6.99E-04	0.00E+00	no ERL/ERM
Boron	2.84E+01	0.00E+00	no ERL/ERM
Bromomethane	3.10E-02	0.00E+00	no ERL/ERM
Cadmium	2.70E-01	5.40E+00	5.00E-02
Carbon Disulfide	7.71E-03	0.00E+00	no ERL/ERM
Chromium	2.01E+01	0.00E+00	no ERL/ERM
Chrysene	2.57E-02	1.59E+00	1.61E-02
Cobalt	8.99E+00	0.00E+00	no ERL/ERM
Copper	2.68E+01	1.52E+02	1.76E-01
Iron	2.01E+04	0.00E+00	no ERL/ERM
Lead	3.05E+01	1.32E+02	2.30E-01
Lithium	2.37E+01	0.00E+00	no ERL/ERM
m,p-Cresol	3.75E-02	0.00E+00	no ERL/ERM
Manganese	7.11E+02	0.00E+00	no ERL/ERM
Methyl Iodide	4.10E-02	0.00E+00	no ERL/ERM
Molybdenum	6.00E-01	0.00E+00	no ERL/ERM
Nickel	2.06E+01	3.63E+01	5.68E-01
Pyrene	2.65E-02	1.63E+00	1.62E-02
Strontium	1.81E+02	0.00E+00	no ERL/ERM
Titanium	4.05E+01	0.00E+00	no ERL/ERM
Vanadium	2.74E+01	5.70E+01	4.81E-01
Zinc	9.99E+02	2.80E+02	3.57E+00
LPAHs ++	0.00E+00	0.00E+00	no ERL/ERM
HPAH	4.23E-01	5.65E+00	7.49E-02
TOTAL PAHs	3.50E-01	2.44E+01	1.43E-02

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 9.

+ Shading indicates EHQ > 1.

++ No LPAHs were detected in the samples.

TABLE 19
ESTUARINE WETLAND AND AQUATIC HABITAT ASSESSMENT AND MEASUREMENT ENDPOINTS

Receptor Group	Receptor of Potential Concern	Assessment Endpoint for SLERA	Ecological Risk Question	Testable Hypothesis for SLERA	Measurement Endpoint
Benthos and zooplankton	Polychaetes	Protection of benthic invertebrate community from uptake and direct toxic effects on abundance, diversity, and productivity due to chemicals in sediment.	1) Does exposure to chemicals in sediment adversely affect the abundance, diversity, productivity, and function? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor specific screening level based on ERLs available in the literature. 2) Evaluate compound's ability to bioconcentrate. 3) Evaluate likelihood of localized effects (maximum concentration).
Fish and shellfish	Fiddler crab	Protection of invertebrate community abundance, diversity, and productivity due to uptake of chemicals in sediment.	1) Does exposure to chemical in sediment adversely affect the survival, reproduction, or growth? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor specific screening level based on ERLs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Killifish	Protection of localized herbivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment, surface water, and biota.	1) Does exposure to chemical in sediment or surface water adversely affect the survival, reproduction, or growth? 2) Do bioaccumulation factors (BAFs) suggest uptake of chemicals?	Maximum surface water concentrations do not exceed surface water quality standards; and uptake of compounds in sediment and surface water does not result in tissue concentrations greater than literature-based measurements of toxicity.	1) Comparison of maximum concentration for each compound measured at the Site in surface water to surface water quality standards. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and biota.
Carnivorous fish	Black drum	Protection of carnivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment, surface water and prey items.	1) Does exposure to chemicals in sediment, surface water and/or prey items adversely affect the survival, growth, and reproduction of a first order carnivorous fish? 2) Do bioaccumulation factors (BAFs) suggest uptake of chemicals and/or bioaccumulation?	Maximum surface water concentrations do not exceed surface water quality standards; and uptake of compounds in sediment, surface water, and prey items does not result in tissue concentrations greater than literature-based measurements of toxicity.	1) Comparison of maximum concentration for each compound measured at the Site in surface water to surface water quality standards. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and prey items.
	Spotted seatrout	Protection of carnivorous fish survival, growth, and reproduction due to uptake of chemicals in surface water and prey items.	1) Does exposure to chemicals in surface water or prey items adversely affect the survival, growth, and reproduction of a second order carnivorous fish? 2) Do bioaccumulation factors (BAFs) suggest bioaccumulation?	Maximum surface water concentrations do not exceed surface water quality standards; and uptake of compounds in sediment, surface water, and prey items does not result in tissue concentrations greater than literature-based measurements of toxicity.	1) Comparison of maximum concentration for each compound measured at the Site in surface water to surface water quality standards. 2) Evaluate compound's ability to bioconcentrate in prey items.
Avian carnivore	Sandpiper	Protection of carnivorous avian survival, growth, and reproduction due to uptake of chemicals in sediment and prey items and via surface water ingestion.	1) Does exposure to chemicals in sediment, surface water and/or prey items adversely affect the survival, growth, and reproduction of a first order carnivore? 2) Do bioaccumulation factors (BAFs) suggest uptake or bioaccumulation?	95% UCL intake levels do not exceed literature-based measurements of toxicity.	1) Comparison of 95% UCL concentrations in sediment and mobile prey items (fish), and maximum concentrations in sedentary prey items (worms and crab) surface water for each compound measured at the Site to receptor-specific NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and prey items.
	Green heron	Protection of carnivorous avian survival, growth and reproduction due to uptake of chemicals in prey items and via surface water ingestion.	1) Does exposure to chemicals in surface water and prey items adversely affect the survival, growth, and reproduction of a second order carnivore? 2) Do bioaccumulation factors (BAFs) suggest bioaccumulation?	95% UCL intake levels do not exceed literature-based measurements of toxicity.	1) Comparison of 95% UCL concentrations in sediment and mobile prey items (fish), and maximum concentrations in sedentary prey items (worms and crab) surface water for each compound measured at the Site to receptor-specific NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and prey items.

Notes:

SLERA – Screening-Level Ecological Risk Assessment

BAF – biota accumulation factor

BSAF – biota to sediment accumulation factor

NOAEL – no observable adverse effects level

95% UCL – 95 percent upper confidence limit on the mean

ERL – Effects Range Low

TABLE 25
ECOLOGICAL HAZARD QUOTIENTS EXCEEDING ONE FOR SEDIMENT AND SURFACE WATER*

MEDIA	RECEPTOR	MEDIA OF POTENTIAL ECOLOGICAL CONCERN	CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	TOXICITY VALUE*	EXPOSURE POINT CONCENTRATION (mg/kg)	BASIS FOR EPC	EHQ
Intracoastal Waterway	Polychaetes (<i>Capitella capitata</i>)	Sediment	4,4'-DDT	ERL	3.32E-03	Maximum	2.8
		Sediment	Acenaphthene	ERL	6.31E-02	Maximum	4
		Sediment	Benz(a)anthracene	ERL	3.95E-01	Maximum	1.5
		Sediment	Chrysene	ERL	4.75E-01	Maximum	1.2
		Sediment	Dibenzo(a,h)anthracene	ERL	2.35E-01	Maximum	3.7
		Sediment	Fluoranthene	ERL	8.04E-01	Maximum	1.3
		Sediment	Fluorene	ERL	4.60E-02	Maximum	2.4
		Sediment	Hexachlorobenzene	AET	3.19E-02	Maximum	5.3
		Sediment	Phenanthrene	ERL	5.08E-01	Maximum	2.1
		Sediment	Pyrene	ERL	8.62E-01	Maximum	1.3
Background Intracoastal Waterway	Polychaetes (<i>Capitella capitata</i>)	Sediment	LPAH	ERL	7.10E-01	Maximum	1.3
		Sediment	HPAH	ERL	4.91E+00	Maximum	2.9
		Sediment	Total PAH	ERL	5.62E+00	Maximum	1.4
		Sediment	Dibenzo(a,h)anthracene	midpoint ERL/ERM	2.35E-01	Maximum	1.5
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment	Arsenic	ERL	9.82E+00	Maximum	1.2
		Sediment	Nickel	ERL	2.73E+01	Maximum	1.3
		Sediment	none	midpoint ERL/ERM			<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
Wetlands	Polychaetes (<i>Capitella capitata</i>)	Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Aquatic Invertebrates and Fish	Surface Water	4,4'-DDT	Water Quality Standard	1.3E-05 mg/L	>WQS
		Aquatic Invertebrates and Fish	Surface Water	Silver	Water Quality Standard	6E-03 mg/L	>WQS
		Sediment	2-Methylnaphthalene	ERL	4.30E-01	Maximum	6.1
		Sediment	4,4'-DDT	ERL	9.22E-03	Maximum	7.8
		Sediment	Acenaphthene	ERL	1.33E-01	Maximum	8.3
		Sediment	Acenaphthylene	ERL	5.45E-01	Maximum	12.4
		Sediment	Anthracene	ERL	3.34E-01	Maximum	3.9
		Sediment	Arsenic	ERL	1.28E+01	Maximum	1.6
Pond	Polychaetes (<i>Capitella capitata</i>)	Sediment	Benz(a)anthracene	ERL	9.93E-01	Maximum	3.8
		Sediment	Benz(a)pyrene	ERL	1.30E+00	Maximum	3
		Sediment	Benz(g,h,i)perylene	AET	1.94E+00	Maximum	2.9
		Sediment	Chrysene	ERL	4.05E+00	Maximum	10.5
		Sediment	Copper	ERL	4.90E+01	Maximum	1.4
		Sediment	Dibenzo(a,h)anthracene	ERL	2.91E+00	Maximum	45.9
		Sediment	Endrin Aldehyde	ERL	1.00E-02	Maximum	3.8
		Sediment	Endrin Ketone	ERL	1.30E-02	Maximum	4.9
		Sediment	Fluoranthene	ERL	2.17E+00	Maximum	3.6
		Sediment	Fluorene	ERL	1.39E-01	Maximum	7.3
Aquatic Invertebrates and Fish	Polychaetes (<i>Capitella capitata</i>)	Sediment	gamma-Chlordane	ERL	3.60E-03	Maximum	1.6
		Sediment	Indeno(1,2,3-cd)pyrene	AET	1.94E+00	Maximum	3.2
		Sediment	Lead	ERL	2.37E+02	Maximum	5.1
		Sediment	Nickel	ERL	2.77E+01	Maximum	1.3
		Sediment	Phenanthrene	ERL	1.30E+00	Maximum	5.4
		Sediment	Pyrene	ERL	1.64E+00	Maximum	2.5
		Sediment	Zinc	ERL	9.03E+02	Maximum	6
		Sediment	LPAH	ERL	2.90E+00	Maximum	5.2
		Sediment	HPAH	ERL	1.90E+01	Maximum	11.2
		Sediment	TOTAL PAHs	ERL	2.19E+01	Maximum	5.5
Avian Carnivore (Sandpiper)	Avian Carnivore (Green Heron)	Sediment	2-Methylnaphthalene	midpoint ERL/ERM	4.30E-01	Maximum	1.2
		Sediment	Acenaphthylene	midpoint ERL/ERM	5.45E-01	Maximum	1.6
		Sediment	Benz(a)anthracene	midpoint ERL/ERM	9.93E-01	Maximum	1.1
		Sediment	Benz(a)pyrene	midpoint ERL/ERM	1.30E+00	Maximum	1.3
		Sediment	Chrysene	midpoint ERL/ERM	4.04E+00	Maximum	2.5
		Sediment	Dibenzo(a,h)anthracene	midpoint ERL/ERM	2.91E+00	Maximum	18
		Sediment	Lead	midpoint ERL/ERM	2.37E+02	Maximum	1.8
		Sediment	Phenanthrene	midpoint ERL/ERM	1.30E+00	Maximum	1.5
		Sediment	Zinc	midpoint ERL/ERM	9.03E+02	Maximum	3.2
		Sediment	LPAH	midpoint ERL/ERM	2.90E+00	Maximum	1.6
		Sediment	HPAH	midpoint ERL/ERM	1.90E+01	Maximum	3.4
Avian Carnivore (Sandpiper)	Avian Carnivore (Green Heron)	Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Aquatic Invertebrates and Fish	Surface Water	Acrolein	Water Quality Standard	9.29E-03 mg/L	>WQS
		Aquatic Invertebrates and Fish	Surface Water	Copper	Water Quality Standard	1.1E-02 mg/L	>WQS
		Sediment	4,4'-DDT	ERL	1.57E-03	Maximum	1.3
		Sediment	Zinc	ERL	9.95E+02	Maximum	6.7
		Sediment	Zinc	midpoint ERL/ERM	9.99E+02	Maximum	3.6
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Aquatic Invertebrates and Fish	Surface Water	Silver	Water Quality Standard	2.9E-03 mg/L	Maximum

Notes:

ERL - effects range low

ERM - effects range medium

AET - apparent effects threshold

EHQ - ecological hazard quotient

NOAEL - no observable adverse effects level

PAH - polynuclear aromatic hydrocarbon

LPAH - low-molecular weight PAH

HPAH - high-molecular weight PAH

95% UCL - 95th percentile upper confidence limit on the mean

*See Tables F-2, G-2, H-2, and I-2 in Appendices for further information about the toxicity reference values used in the risk calculations.

* Compounds shown in Table 21 but not listed in this Table, had HQs less than one.

TABLE 27
COPECS* IN SEDIMENT LACKING TOXICITY REFERENCE VALUES

Parameter	Benthic Invertebrates	Avian Carnivore (Sandpiper)	Avian Carnivore (Green Heron)
1,2-Dichlorethane	NV	NV	NV
1,2-Diphenylhydrazine/azobenzene	NV	NV	NV
1,2,4-Trimethylbenzene	NV	NV	NV
1,4-Dichlorobenzene	V	NV	NV
2-Butanone	NV	NV	NV
2-Methylnaphthalene	V	NV	NV
2,4,6-Trichlorophenol	NV	NV	NV
3,3'-Dichlorobenzidine	NV	NV	NV
4,4'-DDD	V	V	V
4,4'-DDT	V	V	V
4,6-Dinitro-2-methylphenol	NV	NV	NV
Acenaphthene	V	NV	NV
Acenaphthylene	V	NV	NV
Acetone	NV	V	V
Aluminum	NV	V	V
Anthracene	V	NV	NV
Antimony	V	NV	NV
Arsenic	V	NV	NV
Atrazine (Aatrex)	NV	NV	NV
Barium	V	NV	NV
Benzo(a)anthracene	V	NV	NV
Benzo(a)pyrene	V	NV	NV
Benzo(b)fluoranthene	V	NV	NV
Benzo(g,h,i)perylene	V	NV	NV
Benzo(k)fluoranthene	V	NV	NV
Beryllium	NV	NV	NV
beta-BHC	NV	NV	NV
Boron	V	NV	NV
Bromomethane	NV	NV	NV
Butyl Benzyl Phthalate	NV	NV	NV
Cadmium	V	V	V
Carbazole	NV	NV	NV
Carbon Disulfide	NV	NV	NV
Chloroform	NV	NV	NV
Chromium	NV	V	V
Chromium VI	NV	V	V
Chrysene	V	NV	NV
cis-1,2-Dichloroethene	NV	NV	NV
Cobalt	NV	NV	NV
Copper	V	V	V
Cyclohexane	NV	NV	NV
Dibenz(a,h)anthracene	V	NV	NV
Dibenzofuran	V	NV	NV
Diethyl Phthalate	NV	V	V
Di-n-octyl Phthalate	NV	V	V
Endosulfan Sulfate	NV	NV	NV
Endrin Aldehyde	V	V	V
Endrin Ketone	V	V	V
Fluoranthene	V	NV	NV
Fluorene	V	NV	NV
gamma-Chlordane	V	V	V
Hexachlorobenzene	V	V	V
Indeno(1,2,3-cd)pyrene	V	NV	NV
Iron	NV	NV	NV
Isopropylbenzene (cumene)	NV	NV	NV
Lead	V	V	V
Lithium	NV	NV	NV
m,p-Cresol	NV	NV	NV
Manganese	V	NV	NV
Mercury	V	V	V
Methylcyclohexane	NV	NV	NV
Methyl Iodide	NV	NV	NV
Molybdenum	NV	V	V
Nickel	V	V	V
n-Nitrosodiphenylamine	NV	NV	NV
Phenanthrene	V	NV	NV
Pyrene	V	NV	NV
Silver	V	V	V
Strontium	NV	NV	NV
Tin	NV	NV	NV
Titanium	NV	NV	NV
Toluene	NV	NV	NV
Trichloroethene	V	NV	NV
Vanadium	V	V	V
Xylene	V	NV	NV
Zinc	V	V	V
LPAH	V	NV	NV
HPAH	V	NV	NV
Total PAHs	V	NV	NV

Notes:

* COPECS - Compound of potential ecological concern.

** - Includes fiddler crabs and polychaetes such as *Capitella capitata*.

NV - No toxicity reference value available.

V - Value available and provided in Appendices F, G, H and I.

TABLE 28
COPECS* IN SURFACE WATER LACKING SURFACE WATER QUALITY CRITERIA**

Parameter	Water Quality Criteria
1,2-Dichloroethane (total)	V
4-Chloroaniline (total)	NV
4,4'-DDD (total)	V
4,4'-DDT (total)	V
Acetone (total)	V
Acrolein (total)	V
Acrylonitrile (total)	V
Aldrin (total)	V
Aluminum (total and dissolved)	NV
Antimony (total and dissolved)	NV
Arsenic (total)	NV
Barium (total and dissolved)	V
Benzo(a)pyrene (total)	NV
Benzo(b)fluoranthene (total)	NV
Benzo(g,h,i)perylene (total)	NV
Benzo(k)fluoranthene (total)	NV
Bis(ethylhexyl) Phthalate (total)	NV
Boron (total and dissolved)	NV
Chromium (total and dissolved)	V for dissolved
Chromium VI (total)	NV
Chrysene (total)	NV
Cobalt (total)	NV
Copper (total and dissolved)	V for dissolved
Dibenz(a,h)anthracene (total)	NV
Di-n-butyl Phthalate (total)	V
Di-n-octyl Phthalate (total)	NV
Indeno(1,2,3-cd)pyrene (total)	NV
Iron (total and dissolved)	NV
Lead (total)	NV
Lithium (total and dissolved)	NV
Manganese (total and dissolved)	NV
Mercury (total)	V
Methoxychlor (total)	NV
Molybdenum (total and dissolved)	NV
Nickel (total and dissolved)	V for dissolved
Selenium (total and dissolved)	V
Silver (total and dissolved)	V for dissolved
Strontium (total and dissolved)	NV
Thallium (total and dissolved)	V
Titanium (total)	NV
Vanadium (total and dissolved)	NV
Zinc (total)	NV
HPAHs (total)	NV
Total PAHs (total)	NV

Notes:

* COPECS - Compound of potential ecological concern.

** - Surface water quality criteria are protective of fish and aquatic invertebrates.

NV - No toxicity reference value available.

V - Value available.

TABLE F-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
Polychaetes and Other Benthic Invertebrates

Parameter	Definition		Default
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table F-2	
Chemical	Exposure Point Concentration (mg/kg) (Sc)	ERL	Maximum EHQ
1,2-Dichloroethane	3.02E-03	0.00E+00	no ERL
1,2-Diphenylhydrazine/azobenzene	3.17E-02	0.00E+00	no ERL
2-Methylnaphthalene	1.88E-02	7.00E-02	2.69E-01
3,3'-Dichlorobenzidine	1.51E-01	0.00E+00	no ERL
4,4'-DDT	3.32E-03	1.19E-03	2.79E+00
4,6-Dinitro-2-methylphenol	6.27E-02	0.00E+00	no ERL
Acenaphthene	6.31E-02	1.60E-02	3.94E+00
Aluminum	1.25E+04	0.00E+00	no ERL
Anthracene	7.53E-02	8.53E-02	8.83E-01
Antimony	8.14E+00	9.30E+00	8.75E-01
Arsenic	7.62E+00	8.20E+00	9.29E-01
Atrazine (Aatrex)	8.14E-02	0.00E+00	no ERL
Barium	3.77E+02	0.00E+00	no ERL
Benz(a)anthracene	3.95E-01	2.61E-01	1.51E+00
Benz(a)pyrene	4.45E-01	4.30E-01	1.03E+00
Benz(b)fluoranthene	6.11E-01	1.80E+00	3.39E-01
Benz(g,h,i)perylene	4.42E-01	6.70E-01	6.60E-01
Benz(k)fluoranthene	3.18E-01	1.80E+00	1.77E-01
Beryllium	8.20E-01	0.00E+00	no ERL
Boron	2.72E+01	0.00E+00	no ERL
Butyl Benzyl Phthalate	2.02E-01	0.00E+00	no ERL
Carbazole	8.61E-02	0.00E+00	no ERL
Chloroform	5.27E-03	0.00E+00	no ERL
Chromium	1.44E+01	0.00E+00	no ERL
Chrysene	4.75E-01	3.84E-01	1.24E+00
Cobalt	7.16E+00	0.00E+00	no ERL
Copper	1.26E+01	3.40E+01	3.71E-01
Cyclohexane	1.92E-03	0.00E+00	no ERL
Dibenz(a,h)anthracene	2.35E-01	6.34E-02	3.71E+00
Dibenzo(furan	3.05E-02	1.10E-01	2.77E-01
Diethyl Phthalate	3.89E-02	0.00E+00	no ERL
Di-n-octyl Phthalate	1.92E-01	0.00E+00	no ERL
Fluoranthene	8.04E-01	6.00E-01	1.34E+00
Fluorene	4.60E-02	1.90E-02	2.42E+00
gamma-Chlordane	8.26E-04	2.26E-03	3.65E-01
Hexachlorobenzene	3.19E-02	6.00E-03	5.32E+00
Indeno(1,2,3-c,l)pyrene	4.05E-01	6.00E-01	6.75E-01
Iron	2.82E+04	0.00E+00	no ERL
Isopropylbenzene (cumene)	7.04E-03	0.00E+00	no ERL
Lead	3.23E+01	4.67E+01	6.92E-01
Lithium	2.00E+01	0.00E+00	no ERL
Manganese	4.74E+02	0.00E+00	no ERL
Mercury	3.60E-02	1.50E-01	2.40E-01
Methylcyclohexane	3.70E-03	0.00E+00	no ERL
Molybdenum	5.66E+00	0.00E+00	no ERL
Nickel	1.67E+01	2.09E+01	7.99E-01
n-Nitrosodiphenylamine	4.34E-02	0.00E+00	no ERL
Phenanthrene	5.08E-01	2.40E-01	2.12E+00
Pyrene	8.62E-01	6.65E-01	1.30E+00
Silver	5.40E-01	1.00E+00	5.40E-01
Strontium	8.17E+01	0.00E+00	no ERL
Titanium	3.66E+01	0.00E+00	no ERL
Toluene	5.81E-03	0.00E+00	no ERL
Vanadium	2.12E+01	5.70E+01	3.72E-01
Zinc	9.26E+01	1.50E+02	6.17E-01
LPAH	7.11E-01	5.52E-01	1.29E+00
HPAH	4.99E+00	1.70E+00	2.94E+00
Total PAHs	5.70E+00	4.02E+00	1.42E+00

Notes:

- Notes:**

 - * EPC for benthic receptors is maximum measured concentration from Report Table 6.
 - * Shading indicates EHQ > 1.

TABLE F-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
Polychaetes and Other Benthic Invertebrates – COMPARED WITH MIDPOINT BETWEEN ERL and ERM

Ecological Hazard Quotient = Sc / (midpoint ERL/ERM)			
Parameter	Definition	Default	
Sc ERL/ERM	Sediment Concentration (mg/kg) Midpoint between Effects Range-Low and Effects Range-Medium (mg/kg)	see below see Table F-2	
Chemical	Exposure Point Concentration* (Sc)	ERL/ERM	Maximum EHQ
1,2-Dichloroethane	3.02E-03	0.00E+00	no ERL/ERM
1,2-Diphenylhydrazine/azobenzene	3.17E-02	0.00E+00	no ERL/ERM
2-Methylnaphthalene	1.88E-02	3.70E-01	5.08E-02
3,3'-Dichlorobenzidine	1.51E-01	0.00E+00	no ERL/ERM
4,4'-DDT	3.32E-03	3.20E-02	1.04E-01
4,6-Dinitro-2-methylphenol	6.27E-02	0.00E+00	no ERL/ERM
Acenaphthene	6.31E-02	2.58E-01	2.45E-01
Aluminum	1.25E+04	0.00E+00	no ERL/ERM
Anthracene	7.53E-02	5.93E-01	1.27E-01
Antimony	8.14E+00	9.30E+00	8.75E-01
Arsenic	7.62E+00	3.91E+01	1.95E-01
Atrazine (Aatrex)	8.14E-02	0.00E+00	no ERL/ERM
Barium	3.77E+02	0.00E+00	no ERL/ERM
Benzo(a)anthracene	3.95E-01	9.31E-01	4.25E-01
Benzo(a)pyrene	4.45E-01	1.02E+00	4.38E-01
Benzo(b)fluoranthene	6.11E-01	1.80E+00	3.39E-01
Benzo(g,h,i)perylene	4.42E-01	6.70E-01	6.60E-01
Benzo(k)fluoranthene	3.18E-01	1.80E+00	1.77E-01
Beryllium	8.20E-01	0.00E+00	no ERL/ERM
Boron	2.72E+01	0.00E+00	no ERL/ERM
Butyl Benzyl Phthalate	2.02E-01	0.00E+00	no ERL/ERM
Carbazole	8.61E-02	0.00E+00	no ERL/ERM
Chloroform	5.27E-03	0.00E+00	no ERL/ERM
Chromium	1.44E+01	0.00E+00	no ERL/ERM
Chrysene	4.75E-01	1.59E+00	2.98E-01
Cobalt	7.16E+00	0.00E+00	no ERL/ERM
Copper	1.26E+01	1.52E+02	8.29E-02
Cyclohexane	1.92E-03	0.00E+00	no ERL/ERM
Dibenz(a,h)anthracene	2.35E-01	1.62E-01	1.45E+00
Dibenzofuran	3.05E-02	1.10E-01	2.77E-01
Diethyl Phthalate	3.89E-02	0.00E+00	no ERL/ERM
Di-n-octyl Phthalate	1.92E-01	0.00E+00	no ERL/ERM
Fluoranthene	8.04E-01	2.85E+00	2.82E-01
Fluorene	4.60E-02	2.80E-01	1.65E-01
gamma-Chlordane	8.26E-04	3.53E-03	2.34E-01
Hexachlorobenzene	3.19E-02	6.00E-03	5.32E+00
Indeno(1,2,3-cd)pyrene	4.05E-01	6.00E-01	6.75E-01
Iron	2.82E+04	0.00E+00	no ERL/ERM
Isopropylbenzene (cumene)	7.04E-03	0.00E+00	no ERL/ERM
Lead	3.23E+01	1.32E+02	2.44E-01
Lithium	2.00E+01	0.00E+00	no ERL/ERM
Manganese	4.74E+02	0.00E+00	no ERL/ERM
Mercury	3.60E-02	4.30E-01	8.37E-02
Methylcyclohexane	3.70E-03	0.00E+00	no ERL/ERM
Molybdenum	5.66E+00	0.00E+00	no ERL/ERM
Nickel	1.67E+01	3.63E+01	4.61E-01
n-Nitrosodiphenylamine	4.34E-02	0.00E+00	no ERL/ERM
Phenanthrene	5.08E-01	8.70E-01	5.84E-01
Pyrene	8.62E-01	1.63E+00	5.28E-01
Silver	5.40E-01	2.35E+00	2.30E-01
Strontium	8.17E+01	0.00E+00	no ERL/ERM
Titanium	3.66E+01	0.00E+00	no ERL/ERM
Toluene	5.81E-03	0.00E+00	no ERL/ERM
Vanadium	2.12E+01	5.70E+01	3.72E-01
Zinc	9.26E+01	2.80E+02	3.31E-01
LPAH	7.11E-01	1.86E+00	3.83E-01
HPAH	4.99E+00	5.65E+00	8.84E-01
Total PAHs	5.70E+00	2.44E+01	2.34E-01

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 6.

* Shading indicates EHQ > 1.

TABLE G-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
BACKGROUND
Polychaetes and Other Benthic Invertebrates

Ecological Hazard Quotient = Sc/ERL			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table G-2	
Chemical	Exposure Point Concentration (Sc)	ERL	Maximum EHQ*
1,2,4-Trimethylbenzene	3.91E-03	0.00E+00	no ERL
1,4-Dichlorobenzene	4.11E-03	1.10E-01	3.74E-02
2-Butanone	2.16E-03	0.00E+00	no ERL
4,4'-DDT	5.70E-04	1.19E-03	4.79E-01
Aluminum	2.18E+04	0.00E+00	no ERL
Antimony	7.33E+00	9.30E+00	7.88E-01
Arsenic	9.62E+00	8.20E+00	1.17E+00
Barium	2.80E+02	0.00E+00	no ERL
Benzo(b)fluoranthene	3.69E-02	1.80E+00	2.05E-02
Beryllium	1.32E+00	0.00E+00	no ERL
Boron	4.79E+01	0.00E+00	no ERL
Carbon Disulfide	8.41E-03	0.00E+00	no ERL
Chromium	2.25E+01	0.00E+00	no ERL
cis-1,2-Dichloroethene	2.84E-02	0.00E+00	no ERL
Cobalt	1.18E+01	0.00E+00	no ERL
Copper	1.68E+01	3.40E+01	4.94E-01
Iron	2.79E+04	0.00E+00	no ERL
Lead	1.45E+01	4.67E+01	3.10E-01
Lithium	4.46E+01	0.00E+00	no ERL
Manganese	4.42E+02	0.00E+00	no ERL
Mercury	5.00E-02	1.50E-01	3.33E-01
Molybdenum	3.50E-01	0.00E+00	no ERL
Nickel	2.73E+01	2.09E+01	1.31E+00
Strontium	8.74E+01	0.00E+00	no ERL
Titanium	5.45E+01	0.00E+00	no ERL
Trichloroethene	1.59E-02	4.10E-02	3.88E-01
Vanadium	3.42E+01	5.70E+01	6.00E-01
Xylene	3.35E-03	4.00E-03	8.38E-01
Zinc	5.41E+01	1.50E+02	3.61E-01
LPAHs			no ERL
HPAH	3.69E-02	1.70E+00	2.17E-02
Total PAHs	3.69E-02	4.02E+00	9.17E-03

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 7.

* Shading indicates EHQ > 1.

TABLE H-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
POLYCHAETES AND OTHER BENTHIC INVERTEBRATES

Ecological Hazard Quotient = Sc / ERL			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table H-2	
Chemical	Exposure Point Concentration (Sc)	ERL	Maximum EHQ*
1,2-Dichloroethane	2.40E-03	0.00E+00	no ERL
2-Methylnaphthalene	4.30E-01	7.00E-02	6.14E+00
4,4'-DDT	9.22E-03	1.19E-03	7.75E+00
Acenaphthene	1.33E-01	1.60E-02	8.31E+00
Acenaphthylene	5.45E-01	4.40E-02	1.24E+01
Aluminum	1.82E+04	0.00E+00	no ERL
Anthracene	3.34E-01	8.53E-02	3.92E+00
Antimony	4.24E+00	8.20E+00	5.17E-01
Arsenic	1.28E+01	8.20E+00	1.56E+00
Barium	8.20E+02	0.00E+00	no ERL
Benzo(a)anthracene	9.93E-01	2.61E-01	3.80E+00
Benzo(a)pyrene	1.30E+00	4.30E-01	3.02E+00
Benzo(b)fluoranthene	1.36E+00	1.80E+00	7.56E-01
Benzo(g,h,i)perylene	1.94E+00	6.70E-01	2.90E+00
Benzo(k)fluoranthene	7.30E-01	1.80E+00	4.06E-01
Beryllium	1.37E+00	0.00E+00	no ERL
Boron	4.62E+01	0.00E+00	no ERL
Cadmium	4.80E-01	1.20E+00	4.00E-01
Carbazole	1.41E-01	0.00E+00	no ERL
Carbon Disulfide	6.99E-03	0.00E+00	no ERL
Chromium	4.46E+01	0.00E+00	no ERL
Chromium VI	4.04E+00	0.00E+00	no ERL
Chrysene	4.05E+00	3.84E-01	1.05E+01
Cobalt	9.89E+00	0.00E+00	no ERL
Copper	4.90E+01	3.40E+01	1.44E+00
Dibenz(a,h)anthracene	2.91E+00	6.34E-02	4.59E+01
Dibenzofuran	8.00E-02	1.10E-01	7.27E-01
Endosulfan Sulfate	6.00E-02	0.00E+00	no ERL
Endrin Aldehyde	1.00E-02	2.67E-03	3.75E+00
Endrin Ketone	1.30E-02	2.67E-03	4.87E+00
Fluoranthene	2.17E+00	6.00E-01	3.62E+00
Fluorene	1.39E-01	1.90E-02	7.32E+00
gamma-Chlordane	3.60E-03	2.26E-03	1.59E+00
Indeno(1,2,3-cd)pyrene	1.94E+00	6.00E-01	3.23E+00
Iron	6.09E+04	0.00E+00	no ERL
Lead	2.37E+02	4.67E+01	5.07E+00
Lithium	2.76E+01	0.00E+00	no ERL
Manganese	1.01E+03	0.00E+00	no ERL
Mercury	8.10E-02	1.50E-01	5.40E-01
Molybdenum	3.24E+00	0.00E+00	no ERL
Nickel	2.77E+01	2.09E+01	1.33E+00
Phenanthrene	1.30E+00	2.40E-01	5.42E+00
Pyrene	1.64E+00	6.65E-01	2.47E+00
Strontium	3.30E+02	0.00E+00	no ERL
Tin	4.61E+00	0.00E+00	no ERL
Titanium	6.87E+01	0.00E+00	no ERL
Toluene	2.14E-03	0.00E+00	no ERL
Vanadium	3.20E+01	5.70E+01	5.61E-01
Zinc	9.03E+02	1.50E+02	6.02E+00
LPAH	2.88E+00	5.52E-01	5.22E+00
HPAH	1.90E+01	1.70E+00	1.12E+01
TOTAL PAHs	2.19E+01	4.02E+00	5.45E+00

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 8.

* Shading indicates EHQ > 1.

TABLE H-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
POLYCHAETES AND OTHER BENTHIC INVERTEBRATES -- MIDPOINT BETWEEN ERL AND ERM COMPARISON

Ecological Hazard Quotient = Sc / (midpoint ERL/ERM)		Default	
Parameter	Definition		
Sc	Sediment Concentration (mg/kg)	see below	
ERL/ERM	Midpoint between Effects Range-Low and Effects Range-Medium (mg/kg)	see Table H-2	
Chemical	Exposure Point Concentration* (Sc)	TRV	
		Maximum EHQ	
1,2-Dichloroethane	2.40E-03	0.00E+00	no ERL/ERM
2-Methylnaphthalene	4.30E-01	3.70E-01	1.16E+00
4,4'-DDT	9.22E-03	3.20E-02	2.88E-01
Acenaphthene	1.33E-01	2.58E-01	5.16E-01
Acenaphthylene	5.45E-01	3.42E-01	1.59E+00
Aluminum	1.82E+04	0.00E+00	no ERL/ERM
Anthracene	3.34E-01	5.93E-01	5.64E-01
Antimony	4.24E+00	3.91E+01	1.08E-01
Arsenic	1.28E+01	3.91E+01	3.27E-01
Barium	8.20E+02	0.00E+00	no ERL/ERM
Benz(a)anthracene	9.93E-01	9.31E-01	1.07E+00
Benz(a)pyrene	1.30E+00	1.02E+00	1.28E+00
Benz(b)fluoranthene	1.36E+00	1.80E+00	7.56E-01
Benz(g,h,i)perylene	1.94E+00	6.70E-01	2.90E+00
Benz(k)fluoranthene	7.30E-01	1.80E+00	4.06E-01
Beryllium	1.37E+00	0.00E+00	no ERL/ERM
Boron	4.62E+01	0.00E+00	no ERL/ERM
Cadmium	4.80E-01	5.40E+00	8.89E-02
Carbazole	1.41E-01	0.00E+00	no ERL/ERM
Carbon Disulfide	6.99E-03	0.00E+00	no ERL/ERM
Chromium	4.46E+01	0.00E+00	no ERL/ERM
Chromium VI	4.04E+00	0.00E+00	no ERL/ERM
Chrysene	4.05E+00	1.59E+00	2.54E+00
Cobalt	9.89E+00	0.00E+00	no ERL/ERM
Copper	4.90E+01	1.52E+02	3.22E-01
Dibenz(a,h)anthracene	2.91E+00	1.62E-01	1.80E+01
Dibenzofuran	8.00E-02	1.10E-01	7.27E-01
Endosulfan Sulfate	6.00E-02	0.00E+00	no ERL/ERM
Endrin Aldehyde	1.00E-02	3.25E-02	3.07E-01
Endrin Ketone	1.30E-02	3.25E-02	4.00E-01
Fluoranthene	2.17E+00	2.85E+00	7.61E-01
Fluorene	1.39E-01	2.80E-01	4.97E-01
gamma-Chlordane	3.60E-03	3.53E-03	1.02E+00
Indeno(1,2,3-cd)pyrene	1.94E+00	6.00E-01	3.23E+00
Iron	6.09E-04	0.00E+00	no ERL/ERM
Lead	2.37E+02	1.32E+02	1.79E+00
Lithium	2.76E+01	0.00E+00	no ERL/ERM
Manganese	1.01E+03	0.00E+00	no ERL/ERM
Mercury	8.10E-02	4.30E-01	1.88E-01
Molybdenum	3.24E+00	0.00E+00	no ERL/ERM
Nickel	2.77E+01	3.63E+01	7.64E-01
Phenanthrene	1.30E+00	8.70E-01	1.49E+00
Pyrene	1.64E+00	1.63E+00	1.00E+00
Strontium	3.30E+02	0.00E+00	no ERL/ERM
Tin	4.61E+00	0.00E+00	no ERL/ERM
Titanium	6.87E+01	0.00E+00	no ERL/ERM
Toluene	2.14E-03	0.00E+00	no ERL/ERM
Vanadium	3.20E+01	5.70E+01	5.61E-01
Zinc	9.03E+02	2.80E+02	3.23E+00
LPAH	2.88E+00	1.86E+00	1.55E+00
HPAH	1.90E+01	5.65E+00	3.37E+00
TOTAL PAHs	2.19E+01	2.44E+01	8.98E-01

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 8.

* Shading indicates EHQ > 1.

TABLE I-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
POLYCHAETES AND OTHER BENTHIC INVERTEBRATES

Ecological Hazard Quotient = Sc / ERL			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table I-2	
Chemical	Exposure Point Concentration (Sc)	ERL	Maximum EHQ*
2,4,6-Trichlorophenol	4.29E-02	0.00E+00	no ERL
4,4'-DDD	6.76E-04	1.19E-03	5.68E-01
4,4'-DDT	1.57E-03	1.19E-03	1.32E+00
Acetone	7.98E-02	0.00E+00	no ERL
Aluminum	1.63E+04	0.00E+00	no ERL
Antimony	1.85E+00	9.30E+00	1.99E-01
Arsenic	5.01E+00	8.20E+00	6.11E-01
Barium	4.17E+02	0.00E+00	no ERL
Benzo(b)fluoranthene	1.06E-01	1.80E+00	5.89E-02
Benzo(g,h,i)perylene	1.35E-01	6.70E-01	2.01E-01
Benzo(k)fluoranthene	1.30E-01	1.80E+00	7.22E-02
Beryllium	1.13E+00	0.00E+00	no ERL
beta-BHC	6.99E-04	0.00E+00	no ERL
Boron	2.84E+01	0.00E+00	no ERL
Bromomethane	3.10E-02	0.00E+00	no ERL
Cadmium	2.70E-01	1.20E+00	2.25E-01
Carbon Disulfide	7.71E-03	0.00E+00	no ERL
Chromium	2.01E+01	0.00E+00	no ERL
Chrysene	2.57E-02	3.84E-01	6.69E-02
Cobalt	8.99E+00	0.00E+00	no ERL
Copper	2.68E+01	3.40E+01	7.88E-01
Iron	2.01E+04	0.00E+00	no ERL
Lead	3.05E+01	4.67E+01	6.53E-01
Lithium	2.37E+01	0.00E+00	no ERL
m,p-Cresol	3.75E-02	0.00E+00	no ERL
Manganese	7.11E+02	0.00E+00	no ERL
Methyl Iodide	4.10E-02	0.00E+00	no ERL
Molybdenum	6.00E-01	0.00E+00	no ERL
Nickel	2.06E+01	2.09E+01	9.86E-01
Pyrene	2.65E-02	6.65E-01	3.98E-02
Strontium	1.81E+02	0.00E+00	no ERL
Titanium	4.05E+01	0.00E+00	no ERL
Vanadium	2.74E+01	5.70E+01	4.81E-01
Zinc	9.99E+02	1.50E+02	6.66E+00
LPAHs ++			
HPAH	4.23E-01	1.70E+00	2.49E-01
TOTAL PAHs	3.50E-01	4.02E+00	8.70E-02

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 9.

+ Shading indicates EHQ > 1.

++ No LPAHs were detected in the samples.

TABLE I-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
Polychaetes and Other Benthic Invertebrates -- COMPARED WITH MIDPOINT BETWEEN ERL and ERM

Ecological Hazard Quotient = Sc / (midpoint ERL/ERM)			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL/ERM	Midpoint between Effects Range-Low and Effects Range-Medium (mg/kg)	see TRV summary page	
Chemical	Exposure Point Concentration ^a (Sc)	ERL/ERM	Maximum EHQ ^b
2,4,6-Trichlorophenol	4.29E-02	0.00E+00	no ERL/ERM
4,4'-DDD	6.76E-04	3.20E-02	2.11E-02
4,4'-DDT	1.57E-03	3.20E-02	4.90E-02
Acetone	7.98E-02	0.00E+00	no ERL/ERM
Aluminum	1.63E+04	0.00E+00	no ERL/ERM
Antimony	1.85E+00	9.30E+00	1.99E-01
Arsenic	5.01E+00	3.91E+01	1.28E-01
Barium	4.17E+02	0.00E+00	no ERL/ERM
Benzo(b)fluoranthene	1.06E-01	1.80E+00	5.89E-02
Benzo(g,h,i)perylene	1.35E-01	6.70E-01	2.01E-01
Benzo(k)fluoranthene	1.30E-01	1.80E+00	7.22E-02
Beryllium	1.13E+00	0.00E+00	no ERL/ERM
beta-BHC	6.99E-04	0.00E+00	no ERL/ERM
Boron	2.84E+01	0.00E+00	no ERL/ERM
Bromomethane	3.10E-02	0.00E+00	no ERL/ERM
Cadmium	2.70E-01	5.40E+00	5.00E-02
Carbon Disulfide	7.71E-03	0.00E+00	no ERL/ERM
Chromium	2.01E+01	0.00E+00	no ERL/ERM
Chrysene	2.57E-02	1.59E+00	1.61E-02
Cobalt	8.99E+00	0.00E+00	no ERL/ERM
Copper	2.68E+01	1.52E+02	1.76E-01
Iron	2.01E+04	0.00E+00	no ERL/ERM
Lead	3.05E+01	1.32E+02	2.30E-01
Lithium	2.37E+01	0.00E+00	no ERL/ERM
m,p-Cresol	3.75E-02	0.00E+00	no ERL/ERM
Manganese	7.11E+02	0.00E+00	no ERL/ERM
Methyl Iodide	4.10E-02	0.00E+00	no ERL/ERM
Molybdenum	6.00E-01	0.00E+00	no ERL/ERM
Nickel	2.06E+01	3.63E+01	5.68E-01
Pyrene	2.65E-02	1.63E+00	1.62E-02
Strontium	1.81E+02	0.00E+00	no ERL/ERM
Titanium	4.05E+01	0.00E+00	no ERL/ERM
Vanadium	2.74E+01	5.70E+01	4.81E-01
Zinc	9.99E+02	2.80E+02	3.57E+00
LPAHs ++	0.00E+00	0.00E+00	no ERL/ERM
HPAH	4.23E-01	5.65E+00	7.49E-02
TOTAL PAHs	3.50E-01	2.44E+01	1.43E-02

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 9.

+ Shading indicates EHQ > 1.

++ No LPAHs were detected in the samples.

TABLE 19
ESTUARINE WETLAND AND AQUATIC HABITAT ASSESSMENT AND MEASUREMENT ENDPOINTS

Receptor Group	Receptor of Potential Concern	Assessment Endpoint for SLERA	Ecological Risk Question	Testable Hypothesis for SLERA	Measurement Endpoint
Benthos and zooplankton	Polychaetes	Protection of benthic invertebrate community from uptake and direct toxic effects on abundance, diversity, and productivity due to chemicals in sediment.	1) Does exposure to chemicals in sediment adversely affect the abundance, diversity, productivity, and function? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor specific screening level based on ERLs available in the literature. 2) Evaluate compound's ability to bioconcentrate. 3) Evaluate likelihood of localized effects (maximum concentration).
Fish and shellfish	Fiddler crab	Protection of invertebrate community abundance, diversity, and productivity due to uptake of chemicals in sediment.	1) Does exposure to chemical in sediment adversely affect the survival, reproduction, or growth? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor specific screening level based on ERLs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Killifish	Protection of localized herbivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment, surface water, and biota.	1) Does exposure to chemical in sediment or surface water adversely affect the survival, reproduction, or growth? 2) Do bioaccumulation factors (BAFs) suggest uptake of chemicals?	Maximum surface water concentrations do not exceed surface water quality standards; and uptake of compounds in sediment and surface water does not result in tissue concentrations greater than literature-based measurements of toxicity.	1) Comparison of maximum concentration for each compound measured at the Site in surface water to surface water quality standards. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and biota.
Carnivorous fish	Black drum	Protection of carnivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment, surface water and prey items.	1) Does exposure to chemicals in sediment surface water and/or prey items adversely affect the survival, growth, and reproduction of a first order carnivorous fish? 2) Do bioaccumulation factors (BAFs) suggest uptake of chemicals and/or bioaccumulation?	Maximum surface water concentrations do not exceed surface water quality standards; and uptake of compounds in sediment, surface water, and prey items does not result in tissue concentrations greater than literature-based measurements of toxicity.	1) Comparison of maximum concentration for each compound measured at the Site in surface water to surface water quality standards. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and prey items.
	Spotted seatrout	Protection of carnivorous fish survival, growth, and reproduction due to uptake of chemicals in surface water and prey items.	1) Does exposure to chemicals in surface water or prey items adversely affect the survival, growth, and reproduction of a second order carnivorous fish? 2) Do bioaccumulation factors (BAFs) suggest bioaccumulation?	Maximum surface water concentrations do not exceed surface water quality standards; and uptake of compounds in sediment, surface water, and prey items does not result in tissue concentrations greater than literature-based measurements of toxicity.	1) Comparison of maximum concentration for each compound measured at the Site in surface water to surface water quality standards. 2) Evaluate compound's ability to bioconcentrate in prey items.
Avian carnivore	Sandpiper	Protection of carnivorous avian survival, growth, and reproduction due to uptake of chemicals in sediment and prey items and via surface water ingestion.	1) Does exposure to chemicals in sediment, surface water and/or prey items adversely affect the survival, growth, and reproduction of a first order carnivore? 2) Do bioaccumulation factors (BAFs) suggest uptake or bioaccumulation?	95% UCL intake levels do not exceed literature-based measurements of toxicity.	1) Comparison of 95% UCL concentrations in sediment and mobile prey items (fish), and maximum concentrations in sedentary prey items (worms and crab) surface water for each compound measured at the Site to receptor-specific NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and prey items.
	Green heron	Protection of carnivorous avian survival, growth and reproduction due to uptake of chemicals in prey items and via surface water ingestion.	1) Does exposure to chemicals in surface water and prey items adversely affect the survival, growth, and reproduction of a second order carnivore? 2) Do bioaccumulation factors (BAFs) suggest bioaccumulation?	95% UCL intake levels do not exceed literature-based measurements of toxicity.	1) Comparison of 95% UCL concentrations in sediment and mobile prey items (fish), and maximum concentrations in sedentary prey items (worms and crab) surface water for each compound measured at the Site to receptor-specific NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate from sediment, surface water, and prey items.

Notes:

SLERA – Screening-Level Ecological Risk Assessment

BAF – biota accumulation factor

BSAF – biota to sediment accumulation factor

NOAEL – no observable adverse effects level

95% UCL – 95 percent upper confidence limit on the mean

ERL -- Effects Range Low

TABLE 25
ECOLOGICAL HAZARD QUOTIENTS EXCEEDING ONE FOR SEDIMENT AND SURFACE WATER*

MEDIA	RECEPTOR	MEDIA OF POTENTIAL ECOLOGICAL CONCERN	CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	TOXICITY VALUE*	EXPOSURE POINT CONCENTRATION (mg/kg)	BASIS FOR EPC	EHQ
Intracoastal Waterway	Polychaetes (<i>Capitella capitata</i>)	Sediment	4,4'-DDT	ERL	3.32E-03	Maximum	2.8
		Sediment	Acenaphthene	ERL	6.31E-02	Maximum	4
		Sediment	Benz(a)anthracene	ERL	3.95E-01	Maximum	1.5
		Sediment	Chrysene	ERL	4.75E-01	Maximum	1.2
		Sediment	Dibenz(a,h)anthracene	ERL	2.35E-01	Maximum	3.7
		Sediment	Fluoranthene	ERL	8.04E-01	Maximum	1.3
		Sediment	Fluorene	ERL	4.60E-02	Maximum	2.4
		Sediment	Hexachlorobenzene	AET	3.19E-02	Maximum	5.3
		Sediment	Phenanthrene	ERL	5.08E-01	Maximum	2.1
		Sediment	Pyrene	ERL	8.62E-01	Maximum	1.3
		Sediment	LPAH	ERL	7.10E-01	Maximum	1.3
		Sediment	HPAH	ERL	4.91E+00	Maximum	2.9
		Sediment	Total PAH	ERL	5.62E+00	Maximum	1.4
		Sediment	Dibenz(a,h)anthracene	midpoint ERL/ERM	2.35E-01	Maximum	1.5
	Avian Carnivore (Sandpiper) Avian Carnivore (Green Heron)	Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
Background Intracoastal Waterway	Polychaetes (<i>Capitella capitata</i>)	Sediment	Arsenic	ERL	9.82E+00	Maximum	1.2
		Sediment	Nickel	ERL	2.73E+01	Maximum	1.3
		Sediment	none	midpoint ERL/ERM			<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
Wetlands	Aquatic Invertebrates and Fish	Surface Water	4,4'-DDT	Water Quality Standard	1.3E-05 mg/L	Maximum	>WQS
			Silver	Water Quality Standard	6E-03 mg/L	Maximum	>WQS
			2-Methylnaphthalene	ERL	4.30E-01	Maximum	6.1
			4,4'-DDT	ERL	9.22E-03	Maximum	7.8
			Acenaphthene	ERL	1.33E-01	Maximum	8.3
			Acenaphthylene	ERL	5.45E-01	Maximum	12.4
			Anthracene	ERL	3.34E-01	Maximum	3.9
			Arsenic	ERL	1.28E+01	Maximum	1.6
			Benz(a)anthracene	ERL	9.93E-01	Maximum	3.8
			Benz(a)pyrene	ERL	1.30E+00	Maximum	3
			Benz(g,h,i)perylene	AET	1.94E+00	Maximum	2.9
			Chrysene	ERL	4.05E+00	Maximum	10.5
			Copper	ERL	4.90E+01	Maximum	1.4
			Dibenz(a,h)anthracene	ERL	2.91E+00	Maximum	45.9
			Endrin Aldehyde	ERL	1.00E-02	Maximum	3.8
			Endrin Ketone	ERL	1.30E-02	Maximum	4.9
			Fluoranthene	ERL	2.17E+00	Maximum	3.6
			Fluorene	ERL	1.39E-01	Maximum	7.3
			gamma-Chlordane	ERL	3.60E-03	Maximum	1.6
			Indeno(1,2,3-cd)pyrene	AET	1.94E+00	Maximum	3.2
			Lead	ERL	2.37E+02	Maximum	5.1
			Nickel	ERL	2.77E+01	Maximum	1.3
			Phenanthrene	ERL	1.30E+00	Maximum	5.4
			Pyrene	ERL	1.64E+00	Maximum	2.5
			Zinc	ERL	9.03E-02	Maximum	6
			LPAH	ERL	2.90E+00	Maximum	5.2
			HPAH	ERL	1.90E+01	Maximum	11.2
			TOTAL PAHs	ERL	2.19E+01	Maximum	5.5
			2-Methylnaphthalene	midpoint ERL/ERM	4.30E-01	Maximum	1.2
			Acenaphthylene	midpoint ERL/ERM	5.45E-01	Maximum	1.6
			Benz(a)anthracene	midpoint ERL/ERM	9.93E-01	Maximum	1.1
			Benz(a)pyrene	midpoint ERL/ERM	1.30E+00	Maximum	1.3
			Chrysene	midpoint ERL/ERM	4.04E+00	Maximum	2.5
			Dibenz(a,h)anthracene	midpoint ERL/ERM	2.91E+00	Maximum	18
			Lead	midpoint ERL/ERM	2.37E+02	Maximum	1.8
			Phenanthrene	midpoint ERL/ERM	1.30E+00	Maximum	1.5
			Zinc	midpoint ERL/ERM	9.03E+02	Maximum	3.2
			LPAH	midpoint ERL/ERM	2.90E+00	Maximum	1.6
			HPAH	midpoint ERL/ERM	1.90E+01	Maximum	3.4
	Avian Carnivore (Sandpiper) Avian Carnivore (Green Heron)	Sediment and Surface Water	none	NOAEL		95% UCL	<1
		Sediment and Surface Water	none	NOAEL		95% UCL	<1
Pond	Aquatic Invertebrates and Fish	Surface Water	Acrolein	Water Quality Standard	9.29E-03 mg/L	Maximum	>WQS
			Copper	Water Quality Standard	1.1E-02 mg/L	Maximum	>WQS
			4,4'-DDT	ERL	1.57E-03	Maximum	1.3
			Zinc	ERL	9.95E+02	Maximum	6.7
			Zinc	midpoint ERL/ERM	9.99E+02	Maximum	3.6
Pond	Polychaetes (<i>Capitella capitata</i>)	Sediment and Surface Water	none	NOAEL		95% UCL	<1
			none	NOAEL		95% UCL	<1
Pond	Avian Carnivore (Sandpiper) Avian Carnivore (Green Heron)	Sediment and Surface Water	Silver	Water Quality Standard	2.9E-03 mg/L	Maximum	>WQS

Notes:

ERL - effects range low

ERM - effects range medium

AET - apparent effects threshold

EHQ - ecological hazard quotient

NOAEL - no observable adverse effects level

PAH - polynuclear aromatic hydrocarbon

LPAH - low-molecular weight PAH

HPAH - high-molecular weight PAH

95% UCL - 95th percentile upper confidence limit on the mean

*See Tables F-2, G-2, H-2, and I-2 in Appendices for further information about the toxicity reference values used in the risk calculations.

* Compounds shown in Table 21 but not listed in this Table, had HQs less than one.

TABLE 27
COPECS* IN SEDIMENT LACKING TOXICITY REFERENCE VALUES

Parameter	Benthic Invertebrates**	Avian Carnivore (Sandpiper)	Avian Carnivore (Green Heron)
1,2-Dichlorethane	NV	NV	NV
1,2-Diphenylhydrazine/azobenzene	NV	NV	NV
1,2,4-Trimethylbenzene	NV	NV	NV
1,4-Dichlorobenzene	V	NV	NV
2-Butanone	NV	NV	NV
2-Methylnaphthalene	V	NV	NV
2,4,6-Trichlorophenol	NV	NV	NV
3,3'-Dichlorobenzidine	NV	NV	NV
4,4'-DDD	V	V	V
4,4'-DDT	V	V	V
4,6-Dinitro-2-methylphenol	NV	NV	NV
Acenaphthene	V	NV	NV
Acenaphthylene	V	NV	NV
Acetone	NV	V	V
Aluminum	NV	V	V
Anthracene	V	NV	NV
Antimony	V	NV	NV
Arsenic	V	NV	NV
Atrazine (Aatrex)	NV	NV	NV
Barium	V	NV	NV
Benzo(a)anthracene	V	NV	NV
Benzo(a)pyrene	V	NV	NV
Benzo(b)fluoranthene	V	NV	NV
Benzo(g,h,i)perylene	V	NV	NV
Benzo(k)fluoranthene	V	NV	NV
Beryllium	NV	NV	NV
beta-BHC	NV	NV	NV
Boron	V	NV	NV
Bromomethane	NV	NV	NV
Butyl Benzyl Phthalate	NV	NV	NV
Cadmium	V	V	V
Carbazole	NV	NV	NV
Carbon Disulfide	NV	NV	NV
Chloroform	NV	NV	NV
Chromium	NV	V	V
Chromium VI	NV	V	V
Chrysene	V	NV	NV
cis-1,2-Dichloroethene	NV	NV	NV
Cobalt	NV	NV	NV
Copper	V	V	V
Cyclohexane	NV	NV	NV
Dibenz(a,h)anthracene	V	NV	NV
Dibenzofuran	V	NV	NV
Diethyl Phthalate	NV	V	V
Di-n-octyl Phthalate	NV	V	V
Endosulfan Sulfate	NV	NV	NV
Endrin Aldehyde	V	V	V
Endrin Ketone	V	V	V
Fluoranthene	V	NV	NV
Fluorene	V	NV	NV
gamma-Chlordane	V	V	V
Hexachlorobenzene	V	V	V
Indeno(1,2,3-cd)pyrene	V	NV	NV
Iron	NV	NV	NV
(Isopropylbenzene (cumene))	NV	NV	NV
Lead	V	V	V
Lithium	NV	NV	NV
m,p-Cresol	NV	NV	NV
Manganese	V	NV	NV
Mercury	V	V	V
Methylcyclohexane	NV	NV	NV
Methyl Iodide	NV	NV	NV
Molybdenum	NV	V	V
Nickel	V	V	V
n-Nitrosodiphenylamine	NV	NV	NV
Phenanthrene	V	NV	NV
Pyrene	V	NV	NV
Silver	V	V	V
Strontium	NV	NV	NV
Tin	NV	NV	NV
Titanium	NV	NV	NV
Toluene	NV	NV	NV
Trichloroethene	V	NV	NV
Vanadium	V	V	V
Xylene	V	NV	NV
Zinc	V	V	V
LPAH	V	NV	NV
HPAH	V	NV	NV
Total PAHs	V	NV	NV

Notes:

* COPECS - Compound of potential ecological concern.

** Includes fiddler crabs and polychaetes such as *Capitella capitata*.

NV - No toxicity reference value available.

V - Value available and provided in Appendices F, G, H and I.

TABLE 28
COPECS* IN SURFACE WATER LACKING SURFACE WATER QUALITY CRITERIA**

Parameter	Water-Quality Criteria
1,2-Dichloroethane (total)	V
4-Chloroaniline (total)	NV
4,4'-DDD (total)	V
4,4'-DDT (total)	V
Acetone (total)	V
Acrolein (total)	V
Acrylonitrile (total)	V
Aldrin (total)	V
Aluminum (total and dissolved)	NV
Antimony (total and dissolved)	NV
Arsenic (total)	NV
Barium (total and dissolved)	V
Benzo(a)pyrene (total)	NV
Benzo(b)fluoranthene (total)	NV
Benzo(g,h,i)perylene (total)	NV
Benzo(k)fluoranthene (total)	NV
Bis(ethylhexyl) Phthalate (total)	NV
Boron (total and dissolved)	NV
Chromium (total and dissolved)	V for dissolved
Chromium VI (total)	NV
Chrysene (total)	NV
Cobalt (total)	NV
Copper (total and dissolved)	V for dissolved
Dibenz(a,h)anthracene (total)	NV
Di-n-butyl Phthalate (total)	V
Di-n-octyl Phthalate (total)	NV
Indeno(1,2,3-cd)pyrene (total)	NV
Iron (total and dissolved)	NV
Lead (total)	NV
Lithium (total and dissolved)	NV
Manganese (total and dissolved)	NV
Mercury (total)	V
Methoxychlor (total)	NV
Molybdenum (total and dissolved)	NV
Nickel (total and dissolved)	V for dissolved
Selenium (total and dissolved)	V
Silver (total and dissolved)	V for dissolved
Strontium (total and dissolved)	NV
Thallium (total and dissolved)	V
Titanium (total)	NV
Vanadium (total and dissolved)	NV
Zinc (total)	NV
HPAhs (total)	NV
Total PAHs (total)	NV

Notes:

* COPECS - Compound of potential ecological concern.

** - Surface water quality criteria are protective of fish and aquatic invertebrates.

NV - No toxicity reference value available.

V - Value available.

TABLE F-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
Polychaetes and Other Benthic Invertebrates

Ecological Hazard Quotient = Sc / ERL			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table F-2	
Chemical	"Exposure Point Concentration" (Sc)	ERL	Maximum EPC*
1,2-Dichloroethane	3.02E-03	0.00E+00	no ERL
1,2-Diphenylhydrazine/azobenzene	3.17E-02	0.00E+00	no ERL
2-Methylnaphthalene	1.88E-02	7.00E-02	2.69E-01
3,3'-Dichlorobenzidine	1.51E-01	0.00E+00	no ERL
4,4-DDT	3.32E-03	1.19E-03	2.79E+00
4,6-Dinitro-2-methylphenol	6.27E-02	0.00E+00	no ERL
Aceanaphthene	6.31E-02	1.60E-02	3.94E+00
Aluminum	1.25E+04	0.00E+00	no ERL
Anthracene	7.53E-02	8.53E-02	8.83E-01
Antimony	8.14E+00	9.30E+00	8.75E-01
Arsenic	7.62E+00	8.20E+00	9.29E-01
Atrazine (Aatrex)	8.14E-02	0.00E+00	no ERL
Barium	3.77E+02	0.00E+00	no ERL
Benz[a]anthracene	3.95E-01	2.61E-01	1.51E+00
Benz[a]pyrene	4.45E-01	4.30E-01	1.03E+00
Benz[b]fluoranthene	6.11E-01	1.80E+00	3.39E-01
Benz[g,h,i]perylene	4.42E-01	6.70E-01	6.60E-01
Benz[k]fluoranthene	3.18E-01	1.80E+00	1.77E-01
Beryllium	8.20E-01	0.00E+00	no ERL
Boron	2.72E+01	0.00E+00	no ERL
Butyl Benzyl Phthalate	2.02E-01	0.00E+00	no ERL
Carbazole	8.61E-02	0.00E+00	no ERL
Chloroform	5.27E-03	0.00E+00	no ERL
Chromium	1.44E+01	0.00E+00	no ERL
Chrysene	4.75E-01	3.84E-01	1.24E+00
Cobalt	7.16E+00	0.00E+00	no ERL
Copper	1.26E+01	3.40E+01	3.71E-01
Cyclohexane	1.92E-03	0.00E+00	no ERL
Dibenz[a,h]anthracene	2.35E-01	6.34E-02	3.71E+00
Dibenzofuran	3.05E-02	1.10E-01	2.77E-01
Diethyl Phthalate	3.89E-02	0.00E+00	no ERL
Di-n-octyl Phthalate	1.92E-01	0.00E+00	no ERL
Fluoranthene	8.04E-01	6.00E-01	1.34E+00
Fluorene	4.60E-02	1.90E-02	2.42E+00
gamma-Chlordane	8.26E-04	2.26E-03	3.65E-01
Hexachlorobenzene	3.19E-02	6.00E-03	5.32E+00
Indeno[1,2,3-cd]pyrene	4.05E-01	6.00E-01	6.75E-01
Iron	2.82E+04	0.00E+00	no ERL
Isopropylbenzene (cumene)	7.04E-03	0.00E+00	no ERL
Lead	3.23E+01	4.67E+01	6.92E-01
Lithium	2.00E+01	0.00E+00	no ERL
Manganese	4.74E+02	0.00E+00	no ERL
Mercury	3.60E-02	1.50E-01	2.40E-01
Methylcyclohexane	3.70E-03	0.00E+00	no ERL
Molybdenum	5.66E+00	0.00E+00	no ERL
Nickel	1.67E+01	2.09E+01	7.99E-01
n-Nitrosodiphenylamine	4.34E-02	0.00E+00	no ERL
Phenanthrene	5.08E-01	2.40E-01	2.12E+00
Pyrene	8.62E-01	6.65E-01	1.30E+00
Silver	5.40E-01	1.00E+00	5.40E-01
Strontium	8.17E+01	0.00E+00	no ERL
Titanium	3.66E+01	0.00E+00	no ERL
Toluene	5.81E-03	0.00E+00	no ERL
Vanadium	2.12E+01	5.70E+01	3.72E-01
Zinc	9.26E+01	1.50E+02	6.17E-01
lPAH	7.11E-01	5.52E-01	1.29E+00
HPAH	4.99E+00	1.70E+00	2.94E+00
Total PAHs	5.70E+00	4.02E+00	1.42E+00

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 6.

* Shading indicates EHQ > 1.

TABLE F-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
Polychaetes and Other Benthic Invertebrates – COMPARED WITH MIDPOINT BETWEEN ERL and ERM

Ecological Hazard Quotient = Sc / (midpoint ERL/ERM)			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL/ERM	Midpoint between Effects Range-Low and Effects Range-Medium (mg/kg)	see Table F-2	
Chemical	Exposure Point Concentration* (Sc)	ERL/ERM	Maximum EHQ [†]
1,2-Dichloroethane	3.02E-03	0.00E+00	no ERL/ERM
1,2-Diphenylhydrazine/azobenzene	3.17E-02	0.00E+00	no ERL/ERM
2-Methylnaphthalene	1.88E-02	3.70E-01	5.08E-02
3,3'-Dichlorobenzidine	1.51E-01	0.00E+00	no ERL/ERM
4,4'-DDT	3.32E-03	3.20E-02	1.04E-01
4,6-Dinitro-2-methylphenol	6.27E-02	0.00E+00	no ERL/ERM
Acenaphthene	6.31E-02	2.58E-01	2.45E-01
Aluminum	1.25E+04	0.00E+00	no ERL/ERM
Anthracene	7.53E-02	5.93E-01	1.27E-01
Antimony	8.14E+00	9.30E+00	8.75E-01
Arsenic	7.62E+00	3.91E+01	1.95E-01
Atrazine (Aatrex)	8.14E-02	0.00E+00	no ERL/ERM
Barium	3.77E+02	0.00E+00	no ERL/ERM
Benz(a)anthracene	3.95E-01	9.31E-01	4.25E-01
Benz(a)pyrene	4.45E-01	1.02E+00	4.38E-01
Benz(b)fluoranthene	6.11E-01	1.80E+00	3.39E-01
Benz(g,h,i)perylene	4.42E-01	6.70E-01	6.60E-01
Benz(k)fluoranthene	3.18E-01	1.80E+00	1.77E-01
Beryllium	8.20E-01	0.00E+00	no ERL/ERM
Boron	2.72E+01	0.00E+00	no ERL/ERM
Butyl Benzyl Phthalate	2.02E-01	0.00E+00	no ERL/ERM
Carbazole	8.61E-02	0.00E+00	no ERL/ERM
Chloroform	5.27E-03	0.00E+00	no ERL/ERM
Chromium	1.44E+01	0.00E+00	no ERL/ERM
Chrysene	4.75E-01	1.59E+00	2.98E-01
Cobalt	7.16E+00	0.00E+00	no ERL/ERM
Copper	1.26E+01	1.52E+02	8.29E-02
Cyclohexane	1.92E-03	0.00E+00	no ERL/ERM
Dibenz(a,h)anthracene	2.35E-01	1.62E-01	1.45E+00
Dibenzofuran	3.05E-02	1.10E-01	2.77E-01
Diethyl Phthalate	3.89E-02	0.00E+00	no ERL/ERM
Di-n-octyl Phthalate	1.92E-01	0.00E+00	no ERL/ERM
Fluoranthene	8.04E-01	2.85E+00	2.82E-01
Fluorene	4.60E-02	2.80E-01	1.65E-01
gamma-Chlordane	8.26E-04	3.53E-03	2.34E-01
Hexachlorobenzene	3.19E-02	6.00E-03	5.32E+00
Indeno(1,2,3-cd)pyrene	4.05E-01	6.00E-01	6.75E-01
Iron	2.82E+04	0.00E+00	no ERL/ERM
Isopropylbenzene (cumene)	7.04E-03	0.00E+00	no ERL/ERM
Lead	3.23E+01	1.32E+02	2.44E-01
Lithium	2.00E+01	0.00E+00	no ERL/ERM
Manganese	4.74E+02	0.00E+00	no ERL/ERM
Mercury	3.60E-02	4.30E-01	8.37E-02
Methylcyclohexane	3.70E-03	0.00E+00	no ERL/ERM
Molybdenum	5.66E+00	0.00E+00	no ERL/ERM
Nickel	1.67E+01	3.63E+01	4.61E-01
n-Nitrosodiphenylamine	4.34E-02	0.00E+00	no ERL/ERM
Phenanthrene	5.08E-01	8.70E-01	5.84E-01
Pyrene	8.62E-01	1.63E+00	5.28E-01
Silver	5.40E-01	2.35E+00	2.30E-01
Strontium	8.17E+01	0.00E+00	no ERL/ERM
Titanium	3.66E+01	0.00E+00	no ERL/ERM
Toluene	5.81E-03	0.00E+00	no ERL/ERM
Vanadium	2.12E+01	5.70E+01	3.72E-01
Zinc	9.26E+01	2.80E+02	3.31E-01
LPAH	7.11E-01	1.86E+00	3.83E-01
HPAH	4.99E+00	5.65E+00	8.84E-01
Total PAHs	5.70E+00	2.44E+01	2.34E-01

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 6.

[†] Shading indicates EHQ > 1.

TABLE G-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
BACKGROUND
Polychaetes and Other Benthic Invertebrates

Ecological Hazard Quotient = Sc/ERL			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table G-2	
Chemical	Exposure Point Concentration (Sc)	ERL	Maximum EHQ*
1,2,4-Trimethylbenzene	3.91E-03	0.00E+00	no ERL
1,4-Dichlorobenzene	4.11E-03	1.10E-01	3.74E-02
2-Butanone	2.16E-03	0.00E+00	no ERL
4,4'-DDT	5.70E-04	1.19E-03	4.79E-01
Aluminum	2.18E+04	0.00E+00	no ERL
Antimony	7.33E+00	9.30E+00	7.88E-01
Arsenic	9.62E+00	8.20E+00	1.17E+00
Barium	2.80E+02	0.00E+00	no ERL
Benzo(b)fluoranthene	3.69E-02	1.80E+00	2.05E-02
Beryllium	1.32E+00	0.00E+00	no ERL
Boron	4.79E+01	0.00E+00	no ERL
Carbon Disulfide	8.41E-03	0.00E+00	no ERL
Chromium	2.25E+01	0.00E+00	no ERL
cis-1,2-Dichloroethene	2.84E-02	0.00E+00	no ERL
Cobalt	1.18E+01	0.00E+00	no ERL
Copper	1.68E+01	3.40E+01	4.94E-01
Iron	2.79E+04	0.00E+00	no ERL
Lead	1.45E+01	4.67E+01	3.10E-01
Lithium	4.46E+01	0.00E+00	no ERL
Manganese	4.42E+02	0.00E+00	no ERL
Mercury	5.00E-02	1.50E-01	3.33E-01
Molybdenum	3.50E-01	0.00E+00	no ERL
Nickel	2.73E+01	2.09E+01	1.31E+00
Strontium	8.74E+01	0.00E+00	no ERL
Titanium	5.45E+01	0.00E+00	no ERL
Trichloroethene	1.59E-02	4.10E-02	3.88E-01
Vanadium	3.42E+01	5.70E+01	6.00E-01
Xylene	3.35E-03	4.00E-03	8.38E-01
Zinc	5.41E+01	1.50E+02	3.61E-01
LPAHs			no ERL
HPAH	3.69E-02	1.70E+00	2.17E-02
Total PAHs	3.69E-02	4.02E+00	9.17E-03

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 7.

* Shading indicates EHQ > 1.

TABLE H-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
POLYCHAETES AND OTHER BENTHIC INVERTEBRATES

Ecological Hazard Quotient = Sc / ERL			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table H-2	
Chemical	Exposure Point Concentration* (Sc)	ERL	Maximum EHQ
1,2-Dichloroethane	2.40E-03	0.00E+00	no ERL
2-Methylnaphthalene	4.30E-01	7.00E-02	6.14E+00
4,4'-DDT	9.22E-03	1.19E-03	7.75E+00
Acenaphthene	1.33E-01	1.60E-02	8.31E+00
Acenaphthylene	5.45E-01	4.40E-02	1.24E+01
Aluminum	1.82E+04	0.00E+00	no ERL
Anthracene	3.34E-01	8.53E-02	3.92E+00
Antimony	4.24E+00	8.20E+00	5.17E-01
Arsenic	1.28E+01	8.20E+00	1.56E+00
Barium	8.20E+02	0.00E+00	no ERL
Benz(a)anthracene	9.93E-01	2.61E-01	3.80E+00
Benz(a)pyrene	1.30E+00	4.30E-01	3.02E+00
Benz(b)fluoranthene	1.36E+00	1.80E+00	7.56E-01
Benz(g,h,i)perylene	1.94E+00	6.70E-01	2.90E+00
Benz(k)fluoranthene	7.30E-01	1.80E+00	4.06E-01
Beryllium	1.37E+00	0.00E+00	no ERL
Boron	4.62E+01	0.00E+00	no ERL
Cadmium	4.80E-01	1.20E+00	4.00E-01
Carbazole	1.41E-01	0.00E+00	no ERL
Carbon Disulfide	6.99E-03	0.00E+00	no ERL
Chromium	4.46E+01	0.00E+00	no ERL
Chromium VI	4.04E+00	0.00E+00	no ERL
Chrysene	4.05E+00	3.84E-01	1.05E+01
Cobalt	9.89E+00	0.00E+00	no ERL
Copper	4.90E+01	3.40E-01	1.44E+00
Dibenz(a,h)anthracene	2.91E+00	6.34E-02	4.59E+01
Dibenzofuran	8.00E-02	1.10E-01	7.27E-01
Endosulfan Sulfate	6.00E-02	0.00E+00	no ERL
Endrin Aldehyde	1.00E-02	2.67E-03	3.75E+00
Endrin Ketone	1.30E-02	2.67E-03	4.87E+00
Fluoranthene	2.17E+00	6.00E-01	3.62E+00
Fluorene	1.39E-01	1.90E-02	7.32E+00
gamma-Chlordane	3.60E-03	2.26E-03	1.59E+00
Indeno(1,2,3-cd)pyrene	1.94E+00	6.00E-01	3.23E+00
Iron	6.09E+04	0.00E+00	no ERL
Lead	2.37E+02	4.67E+01	5.07E+00
Lithium	2.76E+01	0.00E+00	no ERL
Manganese	1.01E+03	0.00E+00	no ERL
Mercury	8.10E-02	1.50E-01	5.40E-01
Molybdenum	3.24E+00	0.00E+00	no ERL
Nickel	2.77E+01	2.09E+01	1.33E+00
Phenanthrene	1.30E+00	2.40E-01	5.42E+00
Pyrene	1.64E+00	6.65E-01	2.47E+00
Strontium	3.30E+02	0.00E+00	no ERL
Tin	4.61E+00	0.00E+00	no ERL
Titanium	6.87E+01	0.00E+00	no ERL
Toluene	2.14E-03	0.00E+00	no ERL
Vanadium	3.20E+01	5.70E+01	5.61E-01
Zinc	9.03E+02	1.50E+02	6.02E+00
LPAH	2.88E+00	5.52E-01	5.22E+00
HPAH	1.90E+01	1.70E+00	1.12E+01
TOTAL PAHs	2.19E+01	4.02E+00	5.45E+00

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 8.

* Shading indicates EHQ > 1.

TABLE H-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
POLYCHAETES AND OTHER BENTHIC INVERTEBRATES – MIDPOINT BETWEEN ERL AND ERM COMPARISON

Ecological Hazard Quotient = Sc / (midpoint ERL/ERM)		Default see below see Table H-2
Parameter	Definition	
Sc	Sediment Concentration (mg/kg)	
ERL/ERM	Midpoint between Effects Range-Low and Effects Range-Medium (mg/kg)	
Chemical	Exposure Point Concentration* (Sc)	TRV
		Maximum EHQ*
1,2-Dichloroethane	2.40E-03	0.00E+00
2-Methylnaphthalene	4.30E-01	3.70E-01
4,4'-DDT	9.22E-03	3.20E-02
Acenaphthene	1.33E-01	2.58E-01
Acenaphthylene	5.45E-01	3.42E-01
Aluminum	1.82E+04	0.00E+00
Anthracene	3.34E-01	5.93E-01
Antimony	4.24E+00	3.91E+01
Arsenic	1.28E+01	3.91E+01
Barium	8.20E+02	0.00E+00
Benz(a)anthracene	9.93E-01	9.31E-01
Benz(a)pyrene	1.30E+00	1.02E+00
Benz(b)fluoranthene	1.36E+00	1.80E+00
Benz(g,h,i)perylene	1.94E+00	6.70E-01
Benz(k)fluoranthene	7.30E-01	1.80E+00
Beryllium	1.37E+00	0.00E+00
Boron	4.62E+01	0.00E+00
Cadmium	4.80E-01	5.40E+00
Carbazole	1.41E-01	0.00E+00
Carbon Disulfide	6.99E-03	0.00E+00
Chromium	4.46E+01	0.00E+00
Chromium VI	4.04E+00	0.00E+00
Chrysene	4.05E+00	1.59E+00
Cobalt	9.89E+00	0.00E+00
Copper	4.90E+01	1.52E+02
Dibenz(a,h)anthracene	2.91E+00	1.62E-01
Dibenzofuran	8.00E-02	1.10E-01
Endosulfan Sulfate	6.00E-02	0.00E+00
Endrin Aldehyde	1.00E-02	3.25E-02
Endrin Ketone	1.30E-02	3.25E-02
Fluoranthene	2.17E+00	2.85E+00
Fluorene	1.39E-01	2.80E-01
gamma-Chlordane	3.60E-03	3.53E-03
Indeno(1,2,3-cd)pyrene	1.94E+00	6.00E-01
Iron	6.09E-04	0.00E+00
Lead	2.37E+02	1.32E+02
Lithium	2.76E+01	0.00E+00
Manganese	1.01E+03	0.00E+00
Mercury	8.10E-02	4.30E-01
Molybdenum	3.24E+00	0.00E+00
Nickel	2.77E+01	3.63E+01
Phenanthrene	1.30E+00	8.70E-01
Pyrene	1.64E+00	1.63E+00
Strontium	3.30E+02	0.00E+00
Tin	4.61E+00	0.00E+00
Titanium	6.87E+01	0.00E+00
Toluene	2.14E-03	0.00E+00
Vanadium	3.20E+01	5.70E+01
Zinc	9.03E+02	2.80E+02
LPAH	2.88E+00	1.86E+00
HPAH	1.90E+01	5.65E+00
TOTAL PAHs	2.19E+01	2.44E+01

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 8.

* Shading indicates EHQ > 1.

TABLE I-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
POLYCHAETES AND OTHER BENTHIC INVERTEBRATES

Ecological Hazard Quotient = Sc / ERL			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL	Effects Range-Low (mg/kg)	see Table I-2	
Chemical	Exposure Point Concentration* (Sc)	ERL	Maximum EHQ†
2,4,6-Trichlorophenol	4.29E-02	0.00E+00	no ERL
4,4'-DDD	6.76E-04	1.19E-03	5.68E-01
4,4'-DDT	1.57E-03	1.19E-03	1.32E+00
Acetone	7.98E-02	0.00E+00	no ERL
Aluminum	1.63E+04	0.00E+00	no ERL
Antimony	1.85E+00	9.30E+00	1.99E-01
Arsenic	5.01E+00	8.20E+00	6.11E-01
Barium	4.17E+02	0.00E+00	no ERL
Benzo(b)fluoranthene	1.06E-01	1.80E+00	5.89E-02
Benzo(g,h,i)perylene	1.35E-01	6.70E-01	2.01E-01
Benzo(k)fluoranthene	1.30E-01	1.80E+00	7.22E-02
Beryllium	1.13E+00	0.00E+00	no ERL
beta-BHC	6.99E-04	0.00E+00	no ERL
Boron	2.84E+01	0.00E+00	no ERL
Bromomethane	3.10E-02	0.00E+00	no ERL
Cadmium	2.70E-01	1.20E+00	2.25E-01
Carbon Disulfide	7.71E-03	0.00E+00	no ERL
Chromium	2.01E+01	0.00E+00	no ERL
Chrysene	2.57E-02	3.84E-01	6.69E-02
Cobalt	8.99E+00	0.00E+00	no ERL
Copper	2.68E+01	3.40E+01	7.88E-01
Iron	2.01E+04	0.00E+00	no ERL
Lead	3.05E+01	4.67E+01	6.53E-01
Lithium	2.37E+01	0.00E+00	no ERL
m,p-Cresol	3.75E-02	0.00E+00	no ERL
Manganese	7.11E+02	0.00E+00	no ERL
Methyl Iodide	4.10E-02	0.00E+00	no ERL
Molybdenum	6.00E-01	0.00E+00	no ERL
Nickel	2.06E+01	2.09E+01	9.86E-01
Pyrene	2.65E-02	6.65E-01	3.98E-02
Strontium	1.81E+02	0.00E+00	no ERL
Titanium	4.05E+01	0.00E+00	no ERL
Vanadium	2.74E+01	5.70E+01	4.81E-01
Zinc	9.99E+02	1.50E+02	6.66E+00
LPAHs ++			
HPAH	4.23E-01	1.70E+00	2.49E-01
TOTAL PAHs	3.50E-01	4.02E+00	8.70E-02

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 9.

† Shading indicates EHQ > 1.

++ No LPAHs were detected in the samples.

TABLE I-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
Polychaetes and Other Benthic Invertebrates -- COMPARED WITH MIDPOINT BETWEEN ERL and ERM

Ecological Hazard Quotient = Sc / (midpoint ERL/ERM)			
Parameter	Definition	Default	
Sc	Sediment Concentration (mg/kg)	see below	
ERL/ERM	Midpoint between Effects Range-Low and Effects Range-Medium (mg/kg)	see TRV summary page	
Chemical	Exposure Point Concentration (Sc)	ERL/ERM	Maximum EHQ
2,4,6-Trichlorophenol	4.29E-02	0.00E+00	no ERL/ERM
4,4'-DDD	6.76E-04	3.20E-02	2.11E-02
4,4'-DDT	1.57E-03	3.20E-02	4.90E-02
Acetone	7.98E-02	0.00E+00	no ERL/ERM
Aluminum	1.63E+04	0.00E+00	no ERL/ERM
Antimony	1.85E+00	9.30E+00	1.99E-01
Arsenic	5.01E+00	3.91E+01	1.28E-01
Barium	4.17E+02	0.00E+00	no ERL/ERM
Benzo(b)fluoranthene	1.06E-01	1.80E+00	5.89E-02
Benzo(g,h,i)perylene	1.35E-01	6.70E-01	2.01E-01
Benzo(k)fluoranthene	1.30E-01	1.80E+00	7.22E-02
Beryllium	1.13E+00	0.00E+00	no ERL/ERM
beta-BHC	6.99E-04	0.00E+00	no ERL/ERM
Boron	2.84E+01	0.00E+00	no ERL/ERM
Bromomethane	3.10E-02	0.00E+00	no ERL/ERM
Cadmium	2.70E-01	5.40E+00	5.00E-02
Carbon Disulfide	7.71E-03	0.00E+00	no ERL/ERM
Chromium	2.01E+01	0.00E+00	no ERL/ERM
Chrysene	2.57E-02	1.59E+00	1.61E-02
Cobalt	8.99E+00	0.00E+00	no ERL/ERM
Copper	2.68E+01	1.52E+02	1.76E-01
Iron	2.01E+04	0.00E+00	no ERL/ERM
Lead	3.05E+01	1.32E+02	2.30E-01
Lithium	2.37E+01	0.00E+00	no ERL/ERM
m,p-Cresol	3.75E-02	0.00E+00	no ERL/ERM
Manganese	7.11E+02	0.00E+00	no ERL/ERM
Methyl Iodide	4.10E-02	0.00E+00	no ERL/ERM
Molybdenum	6.00E-01	0.00E+00	no ERL/ERM
Nickel	2.06E+01	3.63E+01	5.68E-01
Pyrene	2.65E-02	1.63E+00	1.62E-02
Strontium	1.81E+02	0.00E+00	no ERL/ERM
Titanium	4.05E+01	0.00E+00	no ERL/ERM
Vanadium	2.74E+01	5.70E+01	4.81E-01
Zinc	9.99E+02	2.80E+02	3.57E+00
LPAHs ++	0.00E+00	0.00E+00	no ERL/ERM
HPAH	4.23E-01	5.65E+00	7.49E-02
TOTAL PAHs	3.50E-01	2.44E+01	1.43E-02

Notes:

* EPC for benthic receptors is maximum measured concentration from Report Table 9.

+ Shading indicates EHQ > 1.

++ No LPAHs were detected in the samples.